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AMERICAN GAS JOURNAL

Established 1859 *Pioneer of the Gas Industry*

Including · GAS INDUSTRY · Est. 1900 ·

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The BARTLETT HAYWARD CO.

Engineers and Founders

BALTIMORE and NEW YORK

DESIGNERS AND BUILDERS OF:

Carburetted Water Gas Plants
Complete Coal Gas Plants
By-Products Plants
Salt Water and Fresh Water Condensers
De Brouwer Charging and Discharging Machines
Purifiers - Steel Tanks - Shaving Scrubbers
Vertical Waste Heat Boilers
Gas Holders

View of Main Plant, Located at Baltimore

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Smithsonian Deposit

IN TWO PARTS—PART ONE

Koppers Material Handling Plants

IN their need for efficient, uninterrupted service, By-Product Coke and Gas Plants and Central Power Stations make exacting demands on material handling plants.

Koppers installations in actual service in many of these plants, are satisfying the rigorous conditions imposed. Rugged and dependable — they prepare, transport and store millions of tons of fuel annually.

A department of the Koppers Construction Company specializing in the handling of materials, invites inquiries from companies with material handling problems.

The Koppers Construction Company

Designers and Builders of
BY-PRODUCT COKE AND GAS PLANTS

Chicago Pittsburgh New York

AMERICAN
GAS JOURNAL
Established 1859 *Pioneer of the Gas Industry*
Including GAS INDUSTRY-Est. 1900.

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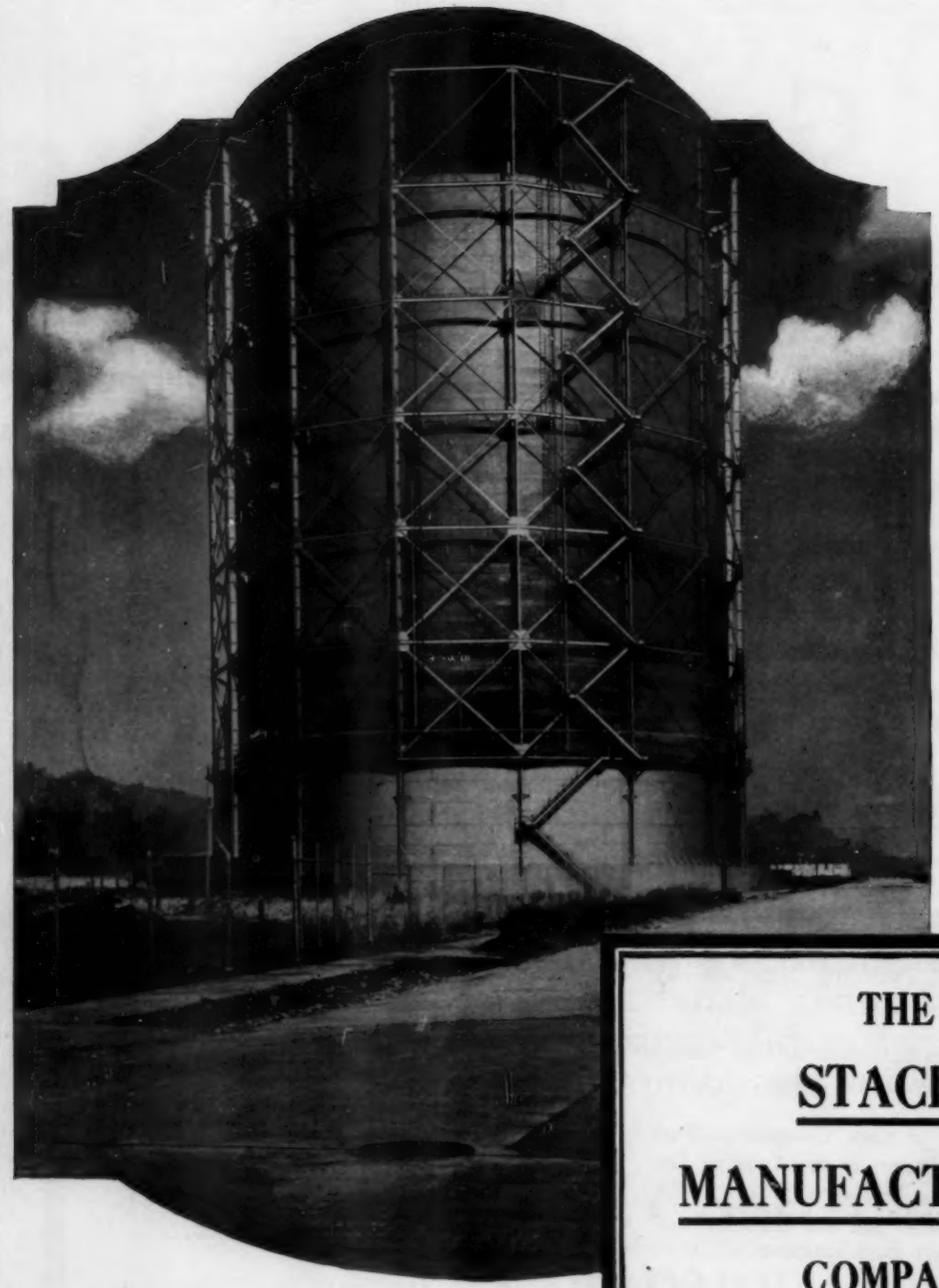

3,000,000 Cu. Ft. 3 Lift Gas Holder
Built for
The Nassau & Suffolk Lighting Co.,
Long Beach, Long Island

77 Years of Service to the Gas Industry

THE
STACEY
MANUFACTURING
COMPANY

CINCINNATI, OHIO

NEW YORK OFFICE
52 Vanderbilt Ave.

Do You Need Pipe in Lengths or Trainloads?

There is not a shop or an organization at the service of industry better equipped than ours to produce steel pipe and fittings of any size.

Recent orders for Steere Steel Pipe have ranged from 4″ to 60″ in diameter and for use at pressures up to 350 pounds.

Our engineers are in constant demand to design and specify piping. The customer's best interest underlies all their recommendations.

This may explain why repeat orders form so generous a percentage of our trade. We have furnished pipe to many of our customers for more than a decade. Steere Steel Pipe, Joints and Fittings are known for quality and economy wherever gas is made.

Simplicity — Low Cost — Long Service

SEMET-SOLVAY
ENGINEERING CORPORATION
Division Allied Chemical and Dye Corp.
40 RECTOR ST. NEW YORK

SMOOT STEAM ACCUMULATOR

Atlantic City Gas Company, Atlantic City, N. J.
The U. G. I. Contracting Company, *Engineers*

Atmospheric Nitrogen Corporation, Hopewell, Va.
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Minneapolis Gas Light Co., Minneapolis, Minn.
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The U. G. I. Contracting Company, *Engineers*

SMOOT ENGINEERING CORPORATION
136 Liberty Street **New York**

SMOOT CONTROL

U. G. I. SERVICE

what it has been and is

1...Began forty-six years ago.

2...Developed the art of, and equipment for, carburetted water gas manufacture.

3...Improved the methods for gas treatment.

4...Introduced improved coal carbonization methods.

5...Raised the manufacturing and distribution standards in the United States.

6...Sponsored the uniform system of accounting.

7...Maintains research work for the general good of the gas industry.

8...Designs and installs gas manufacturing and distribution equipment at the least cost consistent with proper work and for the customer's best interest.

9...Gives its clients the benefit of the best engineering skill and advice.

10...Gives real significance to the word "SERVICE".

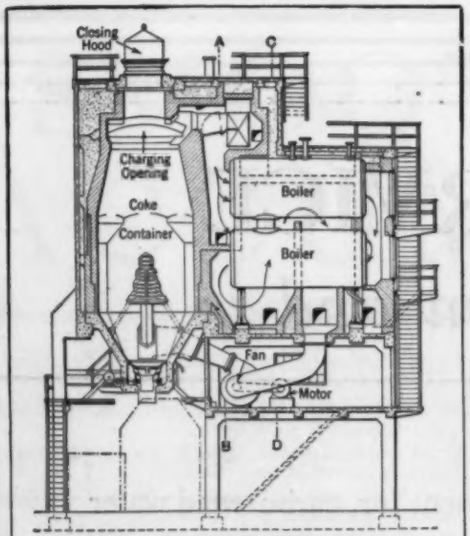
UNITED ENGINEERS & CONSTRUCTORS INC.

DWIGHT P. ROBINSON, President

Succeeding

THE U. G. I. CONTRACTING COMPANY

PRINCIPAL OFFICE — PHILADELPHIA



Diagrammatic view of a Sulzer Dry Quenching Coke plant

Why Dry Quenching?

There are two methods of cooling By-product Coke—

Wet Quenching and Dry Quenching

Let us compare them:

	WET QUENCHING	DRY QUENCHING
1	The heat contained in the glowing coke is entirely wasted.	*The heat of the glowing coke is reclaimed and utilized for steam generation.*
2	The sudden quenching with water splits the coke, thereby increasing the amount of coke breeze and dust.	*Dry Quenched coke is cooled slowly. Hence it is stronger, of better quality and contains less breeze and dust.*
3	Wet Quenched coke contains a large proportion of moisture, entailing increased fuel consumption when the coke is burned.	*Dry Quenched coke is absolutely dry and produces better thermal efficiency in both blast furnace and gas house practice.*
4	In cold weather, difficulties are encountered due to freezing.	*No water used in Dry Quenching—hence there is no freezing.*
5	In regions where the water supply is limited, wet quenching is wasteful and costly.	*There is no water to furnish, pump and dispose of, in Dry Quenching.*

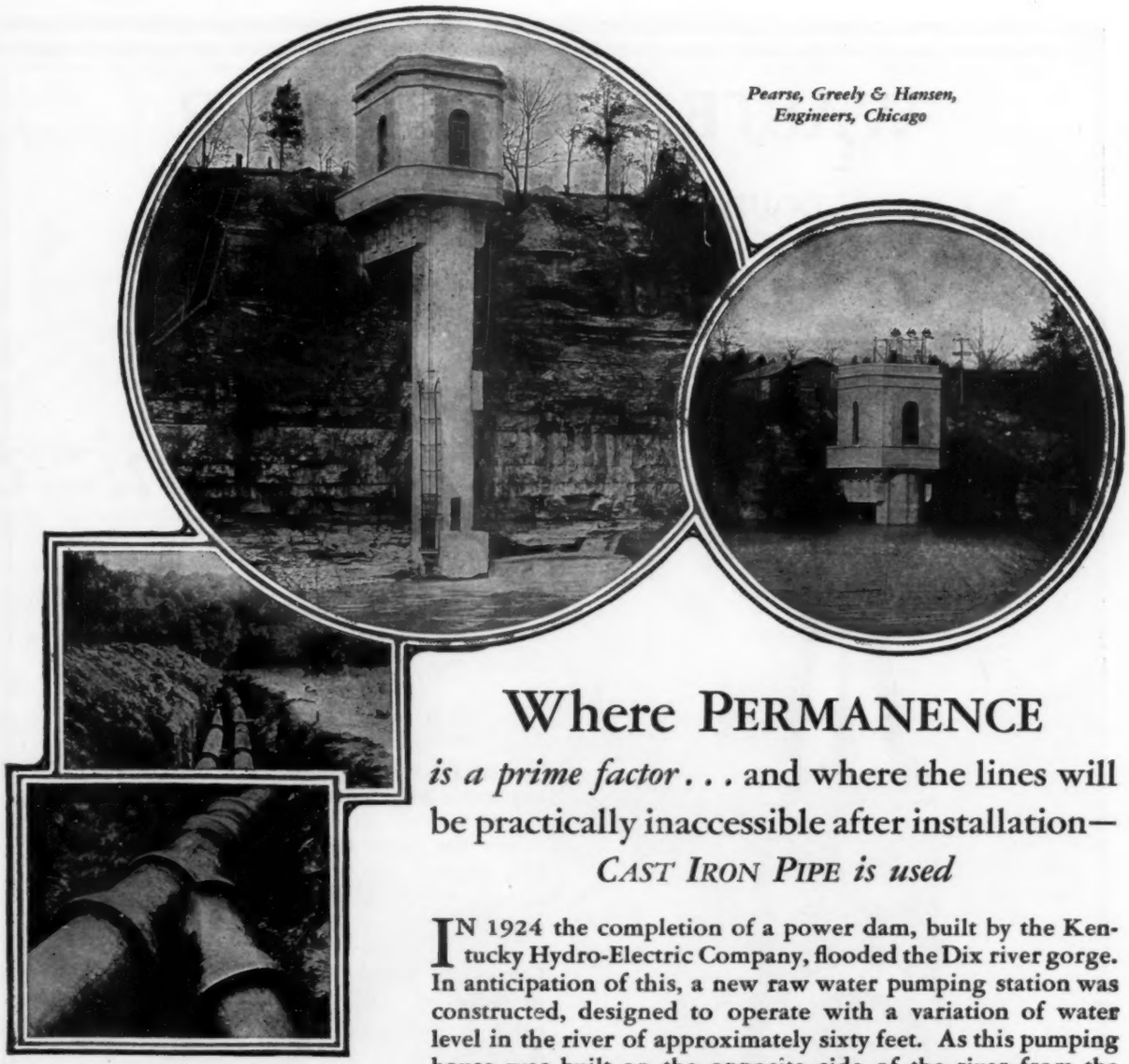
THE Sulzer System for Dry Quenching coke is simple and dependable. The hot coke is charged into a sealed quenching chamber. Inert gases are circulated in a closed cycle by means of a fan, first through the hot coke mass where they absorb the sensible heat of the glowing coke, and thence through a steam boiler where hot gases transfer this heat to the water in the boiler circulation and convert it into steam. Literature describing the Sulzer System will be sent upon request.

Dry Quenching Equipment Corporation

INTERNATIONAL COMBUSTION BUILDING

200 MADISON AVE. NEW YORK ~ N.Y.

A SUBSIDIARY OF INTERNATIONAL COMBUSTION ENGINEERING CORPORATION



Pearse, Greely & Hansen, Engineers, Chicago

Where PERMANENCE

is a prime factor . . . and where the lines will be practically inaccessible after installation—

CAST IRON PIPE is used

IN 1924 the completion of a power dam, built by the Kentucky Hydro-Electric Company, flooded the Dix river gorge. In anticipation of this, a new raw water pumping station was constructed, designed to operate with a variation of water level in the river of approximately sixty feet. As this pumping house was built on the opposite side of the river from the city, a pipe line crossing became necessary. Two substantial parallel lines were built under the river, joined to form one supply line on the shore. Because of the almost impossible task of reaching these lines for repairs after the dam had been filled, Bell and Spigot Cast Iron Pipe was used.

Much helpful data for the engineer and contractor is contained in the U. S. Cast Iron Pipe Handbook. May we send your copy now?

United States Cast Iron Pipe and Foundry Company

General Offices:
Burlington, New Jersey

Philadelphia: 1421 Chestnut St.
Chicago: 122 So. Michigan Blvd.
Birmingham: 1st Ave. & 20th St.
Buffalo: 957 East Ferry Street
Cleveland: 1150 East 26th Street
New York: 71 Broadway

San Francisco: 3rd & Market Sts.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts.
Minneapolis: 6th Street & Hennepin Avenue

WASTE HEAT BOILER

STEAM CURTAIN
DOUBLE GATE HOT GAS VALVE
for
Carburetted Water Gas Apparatus

Placed between superheater outlet of water gas set and inlet of waste heat boiler.

When closed, the valve is automatically filled with live or exhaust steam of a slightly higher pressure than that in the superheater.

The steam prevents carburetted water gas from leaking from the superheater into the waste heat boiler, making a steam curtain in the waste heat boiler unnecessary.

When the valve is open, a fire brick lined ring between the valve seats provides a continuous fire brick lined passage for the blast gases.

One waste heat boiler may be used for two or three sets, by placing one steam curtain valve at the outlet of each superheater and connecting same into one header leading to the waste heat boiler.

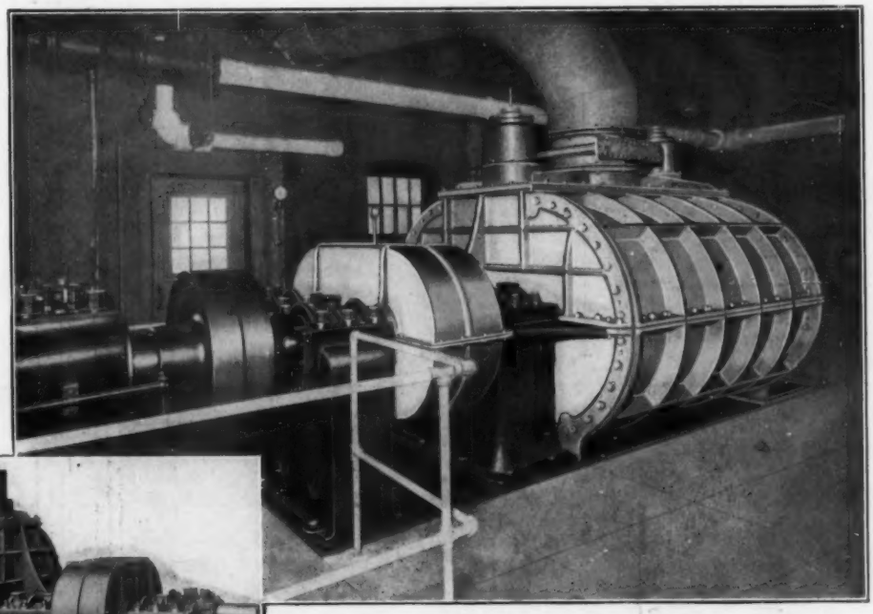
No stack valve is required at outlet of waste heat boiler.

Patent allowed.

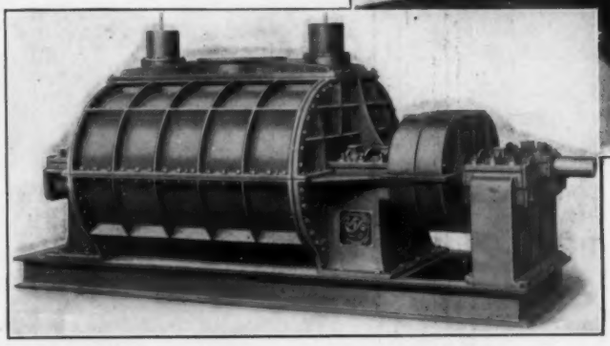
THE GAS MACHINERY COMPANY
CLEVELAND, OHIO

Another Connersville Blower for Queensborough's Water Gas Plant

Some years ago a Connersville Positive Pressure Blower was installed to supply the blast for a Water Gas Generator in the Rockaway Beach, N. Y., plant of the Queensborough Gas & Electric Company.



Cut on right shows the original Connersville Blowers, installed in the plant of the Queensborough Gas & Electric Company.



On the left is shown the new unit recently installed for this company.

The mechanical excellence and service performance of this installation was so satisfactory that when it became necessary to make additions, a second Connersville unit was installed for the same service.

Simplicity, ruggedness, accessibility, dependability and low cost of maintenance, such as characterize all Connersville Gas Apparatus, are the reasons why many users, large and small, re-order Connersville equipment, without competitive quotations.

Catalog 22 gives details, or consult nearest office.

THE CONNERSVILLE BLOWER COMPANY

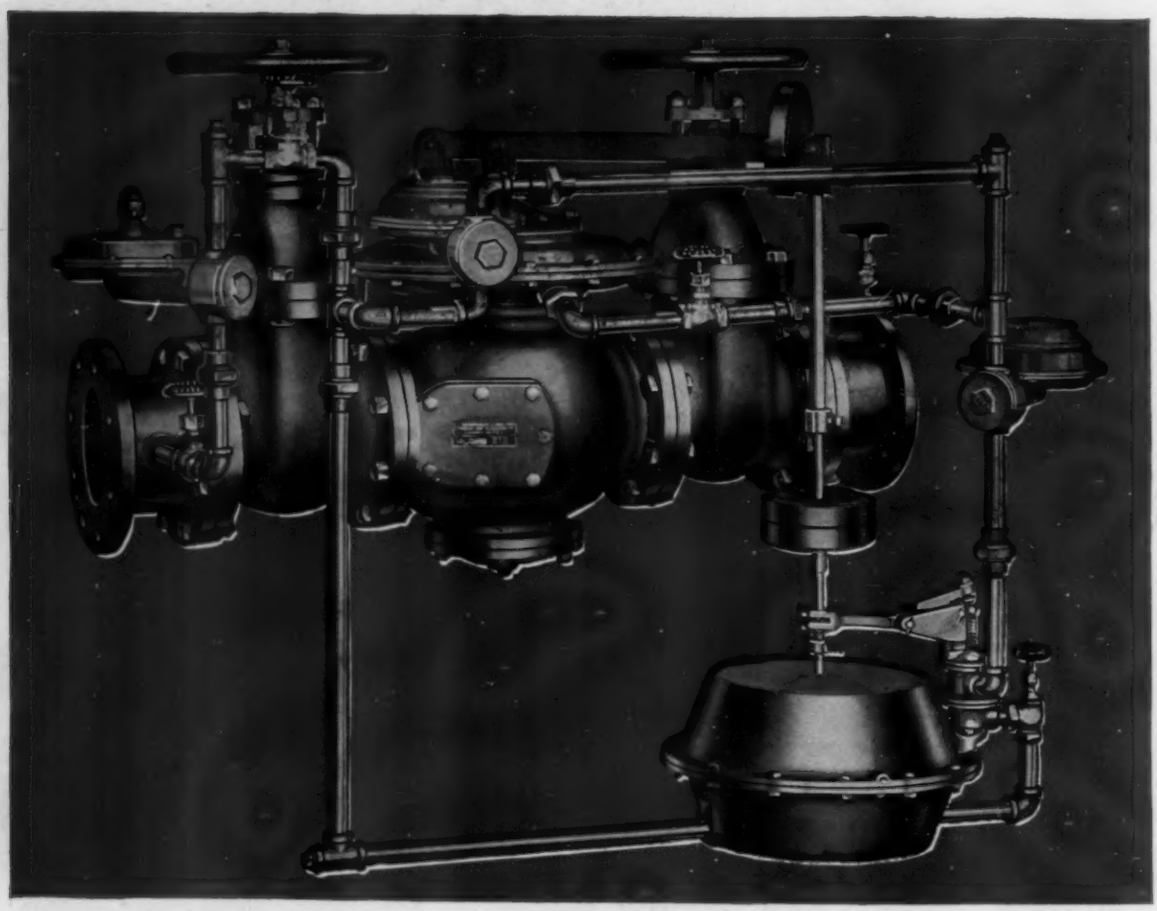
12th Street and Columbia Avenue, Connersville, Indiana

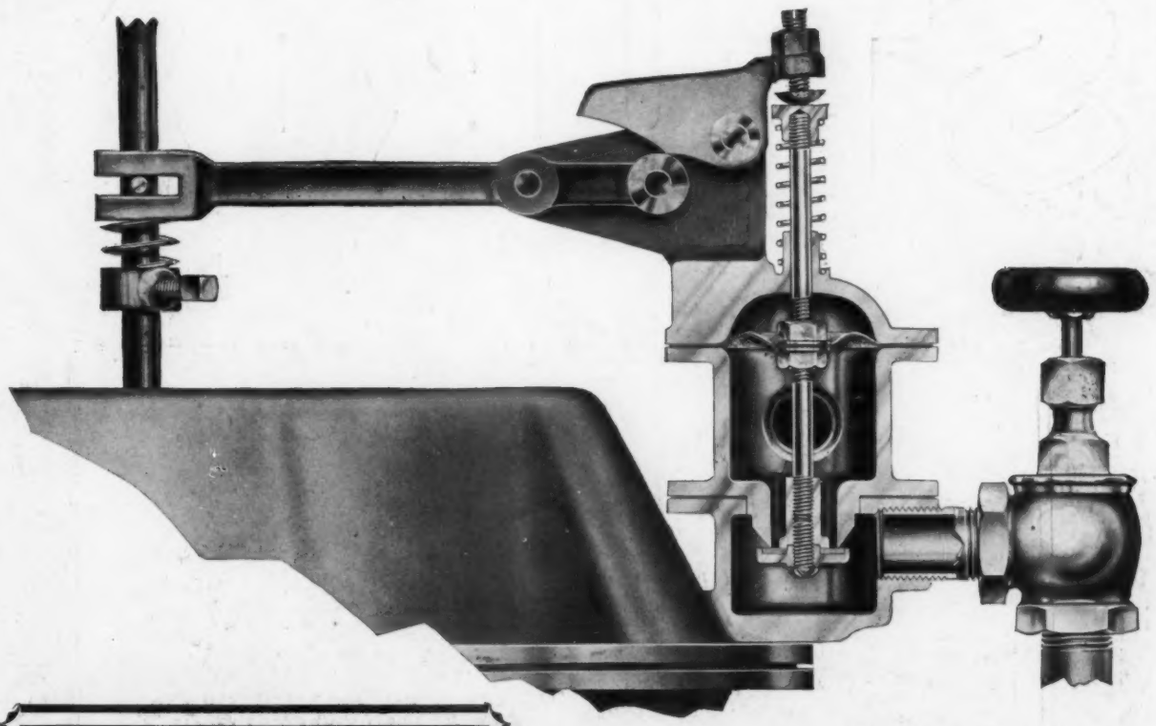
Sales Offices:	1454 Monadnock Block Chicago	604 Chamber of Commerce Bldg. Pittsburgh	Eastern Service Co. Boston	114 Liberty St. New York

CONNERSVILLE

Blowers • Gas Pumps • Meters • Cycloidal Pumps

The REYNOLDS Automatic Loader





Outstanding Features of Reynolds Automatic Loader

1—Easily installed on any Reynolds District Regulator now in use.
2—Only requires opening or closing valve to be put in operation or taken out of operation.
3—Gradually builds up the pressure as required by demand without hunting.
4—Has adjustable feature making it adaptable to any condition.
5—Loads to predetermined pressure—no higher.
6—Covers wide range of increase Pressure, 3″ to 14″ W. C.
7—Will operate on a build up as low as .6″ (six-tenths inch) W. C.
8—Shuts build up Pressure off immediately.
9—Absolutely Safe and Dependable.
10—Proven by actual operation before being offered to the trade.

REPRESENTATIVES

EASTERN SERVICE COMPANY, Boston, Mass.
F. E. NEWBERRY, Avon, N. J.
THOS. C. CORIN, Detroit, Mich.
GILLESPIE & SCHWAN, Inc., Dallas, Texas

The Latest REYNOLDS Achievement ... An Automatic Loader

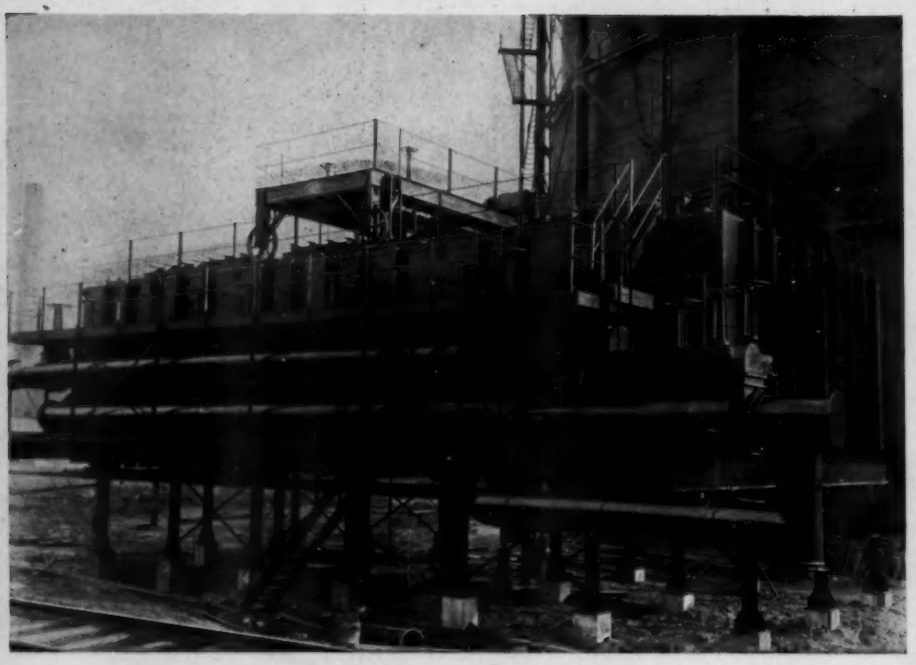
ONE that really works—that builds up pressure as needed without hunting and may be put in or taken out of operation by a turn of the valve.

One that may be easily installed on any of the thousands of Reynolds District Regulators now in use. One that has been proven in actual operation and ready for the trade.

The latest Reynolds achievement offers as great an advance as the original Reynolds device for gas control did more than thirty-five years ago. Complete data furnished on request.

Reynolds
Gas Regulator Company
Anderson, Indiana
ESTABLISHED 1892

STURDY
CONSTRUCTION PAYS



Three 20′ 0″ x 30′ 0″ x 13′ 0″ High Purifier Boxes
for
The Pennsylvania Gas & Electric Company, York, Penna.
This contract finished a two-year building program at York, which also included:—A 100,000 cu. ft. holder, a 54,000 cu. ft. holder, and a 2,000,000 cu. ft. holder.
"There is always a satisfaction in repeat orders."

INTEGRITY
FAIR C-K CO DEALING
SERVICE

CRUSE-KEMPER CO.
AMBLER, PA.
ENGINEERS & CONTRACTORS
BUILDERS OF STURDY GAS HOLDERS
PURIFIERS, SCRUBBERS, CONDENSERS, TANKS, ETC.

The UNIT TYPE

HORIZONTAL GAS *and* COKE OVENS

For Small and Medium Size Gas Plants

The UNIT TYPE — Horizontal Gas and Coke Ovens were developed primarily to meet the requirements of plants having a daily capacity of 250 M. cu ft. and upwards.

TOTAL PLANT LABOR—24 HOURS—FIVE MEN

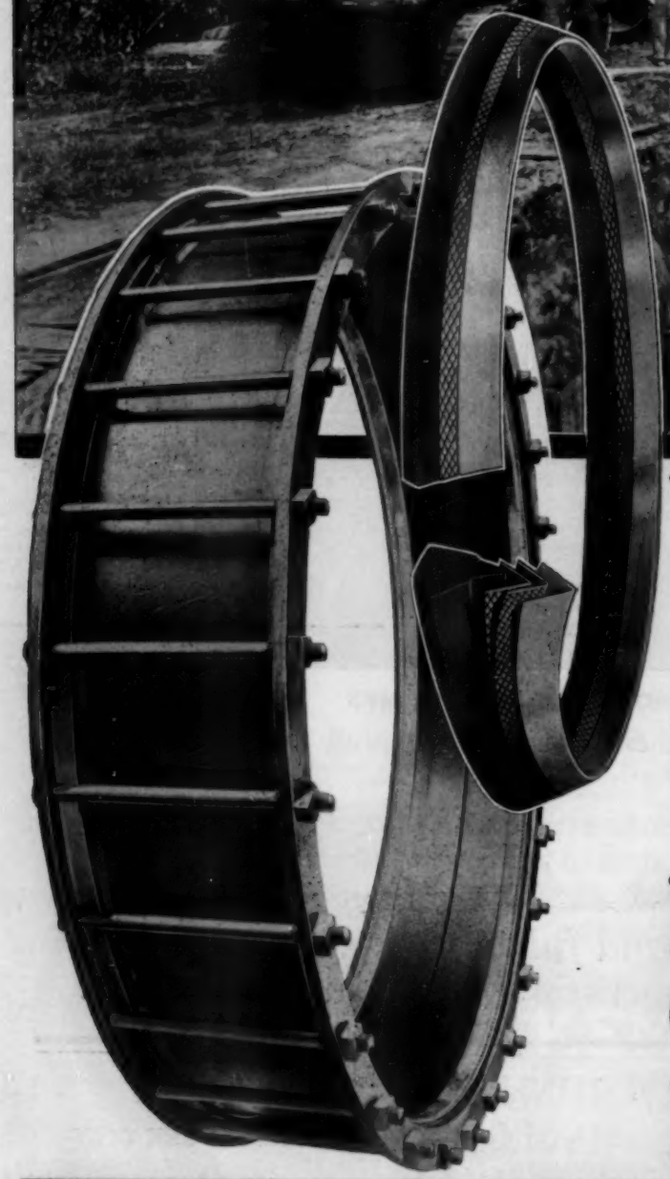
The above illustration shows these Ovens now in full operation in Albion, Michigan.

Every detail was conceived and built with characteristic "IECO" thoroughness by which increased production and economical operation, with the minimum of labor, are obtained.

Write for Special Bulletin and full information regarding plant of Unit Type now operating in Albion, Michigan.

THE IMPROVED EQUIPMENT COMPANY

24 STATE STREET *Engineers-Builders* **NEW YORK CITY**



Preferred~ for Plain End Pipe

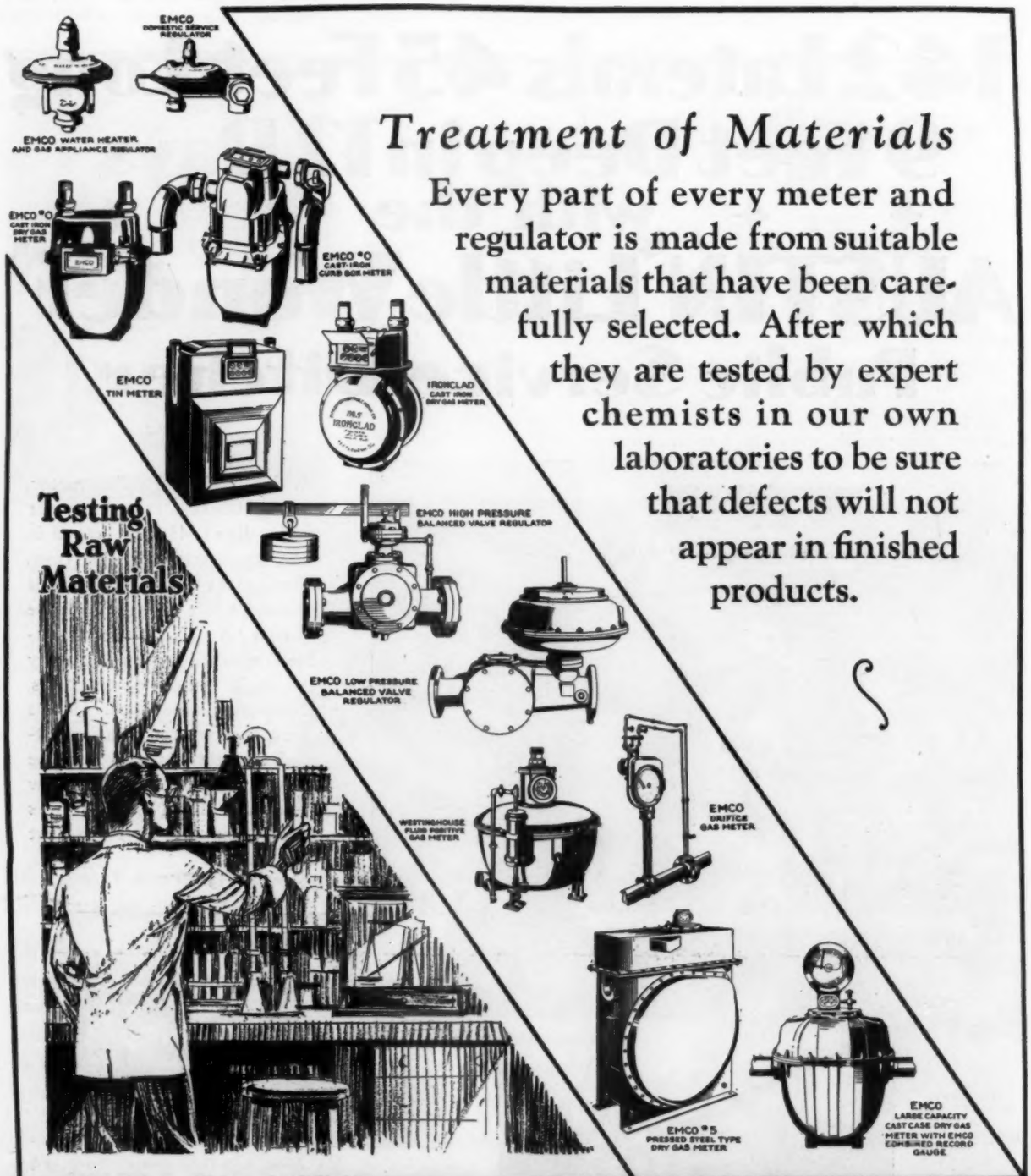
A typical 48" plain end cast iron pipe line connected with Dresser Style 38 Couplings throughout.

Dresser Coupled pipe lines will remain permanently tight under all conditions. As evidence of their absolute tightness, would quote complete telegram just received from a Natural Gas customer, as follows:

"Three hundred mile line, including 16, 18 and 22", tested at 400 pounds without one single case Coupling trouble. Congratulations."

S. R. DRESSER MANUFACTURING COMPANY,
Bradford, Penna.

DRESSER COUPLINGS DOMINATE


EMCO
DOMESTIC SERVICE REGULATOR
EMCO WATER HEATER AND GAS APPLIANCE REGULATOR
EMCO "O" CAST IRON DRY GAS METER
EMCO "O" CAST-IRON CURB BOX METER
EMCO TIN METER
IRONCLAD CAST IRON DRY GAS METER
EMCO HIGH PRESSURE BALANCED VALVE REGULATOR
EMCO LOW PRESSURE BALANCED VALVE REGULATOR
WESTINGHOUSE FLUID POSITIVE GAS METER
EMCO ORIFICE GAS METER
EMCO "5" PRESSED STEEL TYPE DRY GAS METER
EMCO LARGE CAPACITY CAST CASE DRY GAS METER WITH EMCO COMBINED RECORD GAUGE
Testing Raw Materials

Treatment of Materials

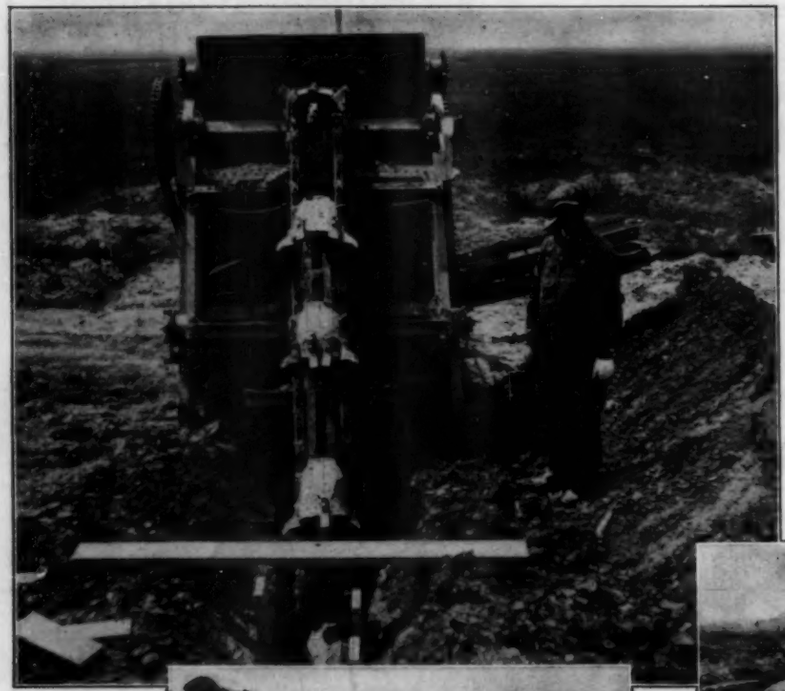
Every part of every meter and regulator is made from suitable materials that have been carefully selected. After which they are tested by expert chemists in our own laboratories to be sure that defects will not appear in finished products.

PITTSBURGH EQUITABLE METER COMPANY

MAIN OFFICE AND WORKS PITTSBURGH, PA.

NEW YORK CHICAGO COLUMBIA, S.C. LOS ANGELES DALLAS
TULSA SEATTLE KANSAS CITY SALT LAKE CITY

142 Laterals 45 Feet Long 9 Feet Deep in 12 Days with the "AUSTIN Little Wonder" Public Service Ditcher



A. Scully, Chicago Contractor, laying laterals from a sewer main, digs a 45 foot lateral in 20 minutes actual digging time. Three pipes in trench had to be crossed while digging. These caused no delay as the back-feed operation carried away the soil under obstructions, eliminating hand work. Delays were encountered locating lateral connections and machine moved 125 feet on each new location. Each lateral was piped complete before next was started.

AUSTIN "IMPROVED" BACKFILLER FOR BACKFILLING LIGHT CRANE OR CLAMSHELL WORK AND PUSHFILLER

AUSTIN "WOLVERINE" SHOVEL—A ONE YARD, GASOLINE POWERED MACHINE WITH HYDRAULIC CONTROL. INTERCHANGEABLE FOR CRANE, CLAMSHELL, DRAGLINE OR PULL-SHOVEL SERVICE.

AUSTIN MACHINERY CORPORATION

MUSKEGON, MICHIGAN

SALES OFFICES

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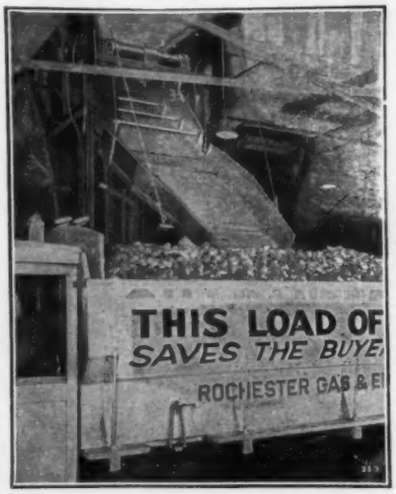
CHICAGO, ILL., 1355 RAILWAY EXCHANGE BLDG.
ST. LOUIS, MO., 1500 N. BROADWAY
CLEVELAND, O., 2112 SUPERIOR VIADUCT
SALT LAKE CITY, 301 NESS BLDG.
DALLAS, TEX., 209½ N. CLINTON ST.
CHATTANOOGA, TENN., 217 FIRST NATL. BANK BLDG.
DETROIT, MICH., 7436 FOURTEENTH ST.
TORONTO, CAN., 17 WALLER AVE.
LOS ANGELES, CAL., 1947 MATEO ST.



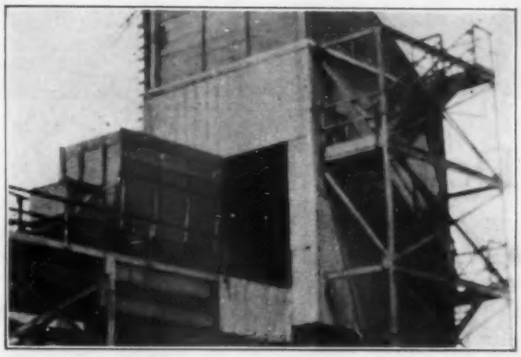
Left—Showing one of a battery of twelve Mitchell Electric Vibrating Screens suspended from structural iron work, under coke storage bins, delivering direct to a truck.

HUNT

Gas Plant Equipment

Industrial Railways, Switches, Motor Operated and Push Cars, Automatic Railways, Conveyors, Mitchell Electric Vibrating Screen, Skip Hoists, Bin and Hopper Gates, Weigh Larries, "Stevedore" Manila Transmission and Hoisting Rope and Drilling Cable, Hunt Rope Couplings, Coke Reclamation Plants, Hoisting Equipment, Also Coal Crackers.

Hunt Automatic Loading, Weighing, Traveling and Dumping Car. Capacity 130 *tons Coal, or* 80 *tons* (32 *lb.*) *coke, per hour at average travel of* 400 *feet—at The Rockaway, N. Y., Plant of the Queensboro Gas & Electric Co.*



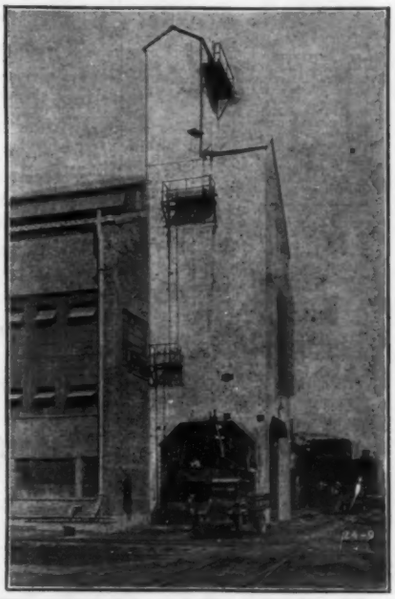
Below — This all-concrete structure enclosing skip hoist and including cut-off gates, swiveling chutes (adaptable to any position for loading both railroad cars and wagons) and weigh larry; — this latter lined with maplewood to protect metal from abrasive action of coke—was designed and built by the C. W. Hunt Co., Inc.

Mr. John H. Wolfe, in his article entitled "Handling Material in Gas Works" in the June issue of this Journal, says:

"The need for continuity of the handling process is apparent to anyone engaged in the business, as the manufacturing process must continue without interruption if satisfactory service is to be rendered and shutdowns averted. This requires a smooth and uniform flow of raw materials into the process and the smooth and uniform removal of any waste or by-product from the process."

Hunt Equipment is the logical solution to many problems involving the task of storing coal and ashes and for sizing and screening coal and coke in the gas plant, with a long record of success.

In the extension of existing systems, or in planning entirely new systems, Hunt Engineers, with an experience of half a century supplemented by a vast amount of accumulated data, can be of inestimable assistance to the progressive gasman.



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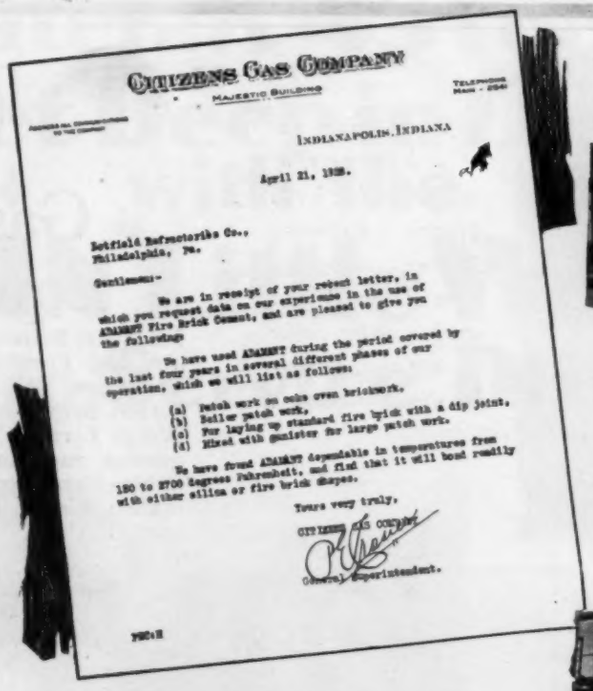


CITIZENS GAS COMPANY
MAJESTIC BUILDING
INDIANAPOLIS, INDIANA

April 21, 1928.

Botfield Refractories Co.,
Philadelphia, Pa.

Gentlemen-

We are in receipt of your recent letter, in which you request data on our experience in the use of ADAMANT Fire Brick Cement, and are pleased to give you the following:

We have used ADAMANT during the period covered by the last four years in several different phases of our operation, which we will list as follows:

(a) Patch work on coke oven brickwork.
(b) Boiler patch work,
(c) For laying up standard fire brick with a dip joint,
(d) Mixed with gunite for large patch work.

We have found ADAMANT dependable in temperatures from 180 to 2700 degrees Fahrenheit, and find that it will bond readily with either silica or fire brick shapes.

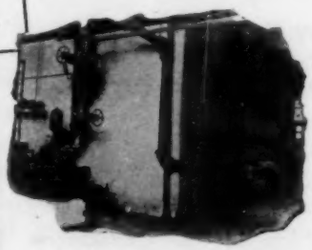
Yours very truly,

CITIZENS GAS COMPANY

General Superintendent.

YHC:H

At Citizens Gas Company, ADAMANT Fire Brick Cement is used for patching refractory construction in these coke ovens. In sealing coke oven jambs, too, gas plants find ADAMANT unusually efficient.



In boiler settings at Citizens Gas Company, ADAMANT Fire Brick Cement is used for laying up fire brick and for patching.

Use The ADAMANT Gun as does this gas plant—for applying protective surfacings of ADAMANT Fire Brick Cement and ADACHROME (or other refractories materials), and you'll find that your fire brick construction will serve longer and relinings will be less frequent. The ADAMANT Gun is the lowest-priced of all refractory guns, costing only $25.00.

"Dependable——"

On Varying Work in the Gas Plant

IN many gas plants, ADAMANT, the *original* high temperature cement, is preferred because of its adaptability to varying jobs. ADAMANT is ideal not only as a bond for fire brick, but also as a binder for other refractories in making patching material for repairing brickwork in coke ovens, boiler settings, retorts and water gas machines.

In addition, ADAMANT can be thinned and employed as a coating or surfacing to protect brickwork exposed to flame or heat. Where severe conditions are encountered, such as low-melting fluxes or slags, severe erosion and abrasion, ADAMANT Fire Brick Cement, pre-mixed with ADACHROME (a chemically-neutral and highly-refractory material) can be used as a protective surfacing applied by means of The ADAMANT Gun, thus providing a coating for the brickwork which is highly resistant to destructive elements.

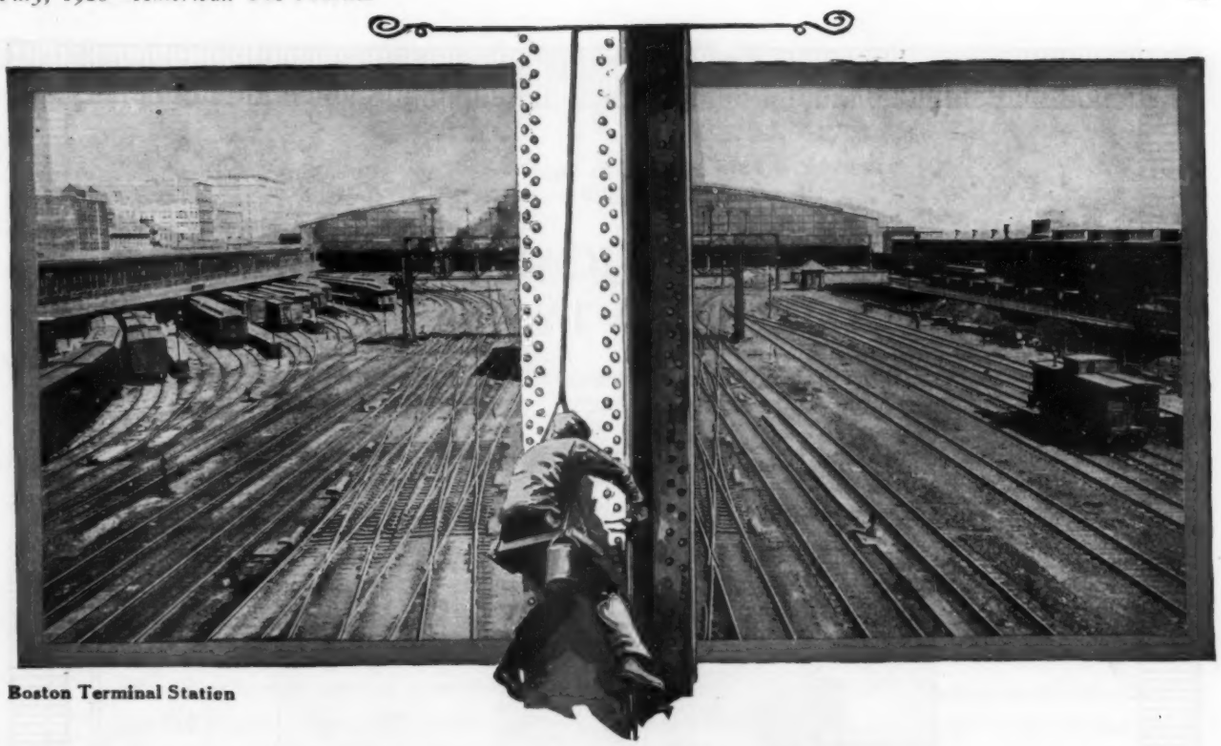
In many other ways, ADAMANT Fire Brick Cement saves refractories maintenance dollars. Data and booklets will be sent gladly to any gas plant. Write us today.

Botfield Refractories Company
Swanson and Clymer Streets
Philadelphia, Pa.

For a Long Furnace Run, Use The ADAMANT *Gun*

ADAMANT
FIRE BRICK CEMENT

Whenever You Use a Fire Brick, Use ADAMANT, *the Original High Temperature Cement*



Boston Terminal Station

Dixon's Silica Graphite **Paint** *used for all maintenance after gruelling tests*

Structural work—iron and steel—in a giant train shed such as this, is very much "between the devil and the deep blue sea." For, on the outside it is exposed to the elements and extremes of weather conditions, and on the inside it is being subjected hourly to the attacks of steam, cinders, smoke, corrosive gases, and fumes which hundreds of locomotives are belching forth.

Not many gas plants have a worse set of atmospheric and operating conditions from which to protect their iron, steel and wooden structures.

The Boston Terminal Company tried out a good many so-called protective paints. They found only one that would stand up for years under their extreme conditions—Dixon's Silica Graphite Paint. Naturally, Dixon's has become the standing specification for all maintenance work around this great terminal.

Dixon's Silica Graphite Paint and Red Lead Graphite Primer have consistently demonstrated their superiority for the protection of all outdoor structures (both wood and steel) and for many indoor purposes. These paints are impervious to moisture and strongly resistent to heat and chemical corrosion. They positively will not crack or "dry out." Made in one quality only,—Dixon's—the best—supplied in 6 colors, also Red Lead Graphite Primer, and Aluminum Graphite.

Yes, Dixon's comes in several serviceable colors

Many people think of Dixon's Silica Graphite Paints as unattractive. Actually it gives a fine durable semi-gloss finish, and it may be had in three tones of gray, dark red, green and black. There is also Dixon's Aluminum Graphite Paint for a silver-grey heat-reflecting finish.

Get the full story of Dixon's Silica Graphite Paint by sending for Booklet No. B-231 today!

JOSEPH DIXON CRUCIBLE COMPANY
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Established 1827

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DIXON'S SILICA GRAPHITE PAINT

Adequate Protection at Minimum Ultimate Cost

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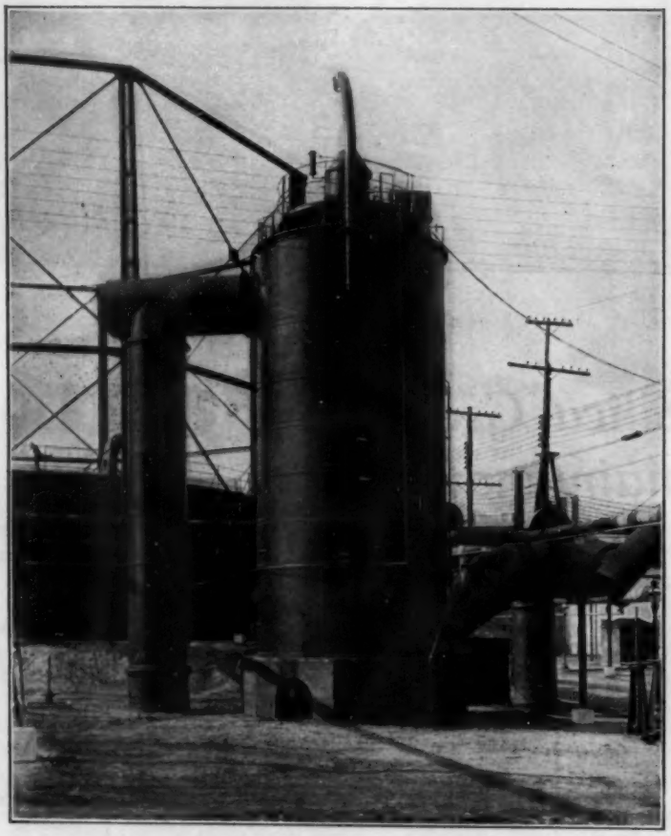

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AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900

HENRY M. RILEY, *Editor*

Don't Neglect the Smaller Companies

THE NUMBER of smaller gas companies and plants in this country far out-number those located in the larger cities. Due to the fact that these smaller towns and communities are generally too far apart for any inter-distribution system connection, at least for the present, they must perforce shape their own destiny and wrestle with problems that are relatively more difficult than in the case of the larger companies.

But it is just as essential, from the standpoint of the Industry as well as the communities which these smaller units serve, that the latter furnish as good service as obtains in the larger cities.

GAS COMPANIES located in the smaller centers must of necessity be manned by individuals with more than average versatility. Thus we might find an employee reading meters part of the time, adjusting complaints on the premises, or still, endeavoring to sell an appliance on the sales floor. From the standpoint of buying and maintaining new plant or distribution equipment, the demands of versatility are quite exacting. The smaller company simply cannot operate in this wise on as wide a safety factor as can his larger brother. An error in the choice of equipment would be readily absorbed in the large company, whereas it might be positively hurtful in the case of the smaller one.

Thus we cannot particularly censure the small company if it plays safe and pursues an ultra-conservative policy in experimenting and exploring in relatively strange territory. But, as indicated, the small company should keep in the van of progress if it is to live up to the best service traditions of the Industry and deserve the entire respect of its particular community. That is to say, it must know how to select equipment and carry on with the element of risk reduced to a trifling minimum. In short the smaller company must receive expert advice and cooperation from its larger fellow utility.

COOPERATION AND ADVICE might be furnished the small utility in a number of ways. His case should continue to receive the special attention of the Association, and every committee should recruit one or more of its personnel from various small gas companies. He should be encouraged to take an active part in conventions and other meetings. More, he should be shown "the works" when visiting the larger company. But, even so, the smaller fellow should show an inclination to find out and get ahead if he is to merit the support of those who can assist him.

You Should Sell Heat During Hot Weather

IT IS EASY TO TALK gas refrigeration during hot weather, and there is no harm in this so long as the supply of gas refrigerators keeps up with the demands. But the same season is the ideal one in which to talk gas heating problems also.

Gas for water heating and gas for space heating should both be given active sales effort. The water heaters provide a summer load at off-peak hours of the day and thus offer the ideal market for improved gas company load curves. It takes no argument to convince the management and salesmen alike that every effort in this direction at this season of the year has a double advantage. It gives a much wanted and appreciated service to the customer, and it gives a better load-factor for the send-out of the company.

Space heating as a subject of summer discussion is somewhat unwelcome to the customer. But when the matter is properly presented, he soon appreciates that he should think of his house-heating problems at this season in order that the work may be done, and the equipment ready, before the first chilly days of September. It is difficult, if not impossible, to replace central heating plants during the colder weather of the Winter. It is undesirable to wait until Fall to make these changes, because at that season there is always difficulty in getting deliveries and uncertainty as to prompt completion of the work. Summer selling of heat is, in fact, more important from the standpoint of the customer than even from the standpoint of the New Business department.

At the risk of getting literally hot under the collar, it would be well to hustle around and see house-heating prospects during July and August.

A Steady Diet Advisable

LOCKING THE STABLE after the horse is stolen is a practice indulged in by a great many people and institutions. Let one house in the neighborhood burn down and at once there is a precipitous rush for further coverage by way of fire insurance—followed by another period of lassitude in this regard.

It is distressing that accident prevention and safety first efforts run in cycles or waves when, as a matter of fact, they should constitute a steady diet in any business or industry.

In his address delivered at the recent National Electric Light Association Convention, Mr. C. E. Paige, vice-president of the Brooklyn Union Gas Company, said: "The public utility industry generally seems to be in the forefront of accident prevention activity, but success is not automatic and can come only from continued effort and stimulus."

We subscribe fully to this thought, particularly the "continued effort and stimulus" portion. If you require your employees to report for their daily work at a certain time you mean just that time, and not twenty or thirty minutes later. In turn, if you supply your men with goggles and other safety measures, do not let such safety equipment and accident prevention rules take periodic vacations. Such lapses might turn out to be unduly expensive.

Safety first activity demands constant attention—and enforcement.

The Other Fellow's Dust

WHAT IS THE PSYCHOLOGY back of the housewife's purchase of an electric cook stove in preference to a gas range? To give the question a national aspect, we will refer the reader to an item under the caption, "It is to weep," on page 60 of this issue, and ask what sort of sales talk influenced the government to buy upwards of two thousand electric cook stoves instead of gas ranges?

In many of the places where these stoves are to be installed there is undoubtedly considerable gas piping which represents a sizable investment on the part of the gas companies as a whole. Accordingly, unless gas burning appliances are connected to such piping there is an obvious loss in revenue.

It is fairly evident that the housewife, or any other purchaser of a cooking appliance, is guided, in the main, by the following considerations:

Appearance of the appliance.
Long life and stability.
Efficiency and cost and ease of operation.
Safety.
Adaptability to space in the kitchen.

Briefly considering the above items, we do not believe the electric cook stove possesses one iota of advantage from the standpoint of appearance; we are positive that the gas range has a longer life and requires vastly less attention and service; and, in turn, the other points can be dismissed with the balance in favor of the gas range.

What, then, lies at the root of the matter? Aggressive salesmanship and attractive publicity, we believe, furnish the answer.

Two-fisted selling will many times enable a salesman to market an article or device in preference to

another that is more appropriate and, indeed, logically better for the buyer to purchase. Give a hard-hitting salesman a modicum of honest merit on which to hand a sales talk and he will come near winning out. Back this effort with alluring advertising and the combination is many times unbeatable.

One swallow might not make a Summer, but it is well to be on our guard and painstakingly vigilant to the end that our "domestic shins" will not be unnecessarily barked and our sense of truthfulness be strained by falling back on un-nourishing alibis.

Provide an Umbrella!

THERE ARE numerous street jobs which are carried out for a long enough time at a single point to justify spreading an umbrella over the workers. A little shade rightly placed provides much comfort; and comfort makes for contented employees and efficient work.

The answer is easy. Look over the system for this kind of jobs and see that each worker who can use a sun umbrella to advantage has one. Perhaps these umbrellas can be made to pay their way a second time by appropriate stenciling with gas company advertising.

Taking Chances

ONE OF THE HARDEST persons to convince that the entire universe is not gleefully conspiring to accomplish his downfall is the average inventor. He evolves an idea, works arduously on it to bring it to somewhere near what he considers perfection, has it patented, and then rather expects a concerted rush on the part of the public to own such a device. No such stampede ensuing, he many times accuses those agencies which he desires to market the article as lacking in proper conception and judgment.

With special reference to patented articles which find their way into the home the inventor shows an irritating lack of knowledge that the same must generally be accompanied by a goodly amount of advertisement and publicity before sales will amount to a ances presented for their consideration for merchansizable figure.

Gas companies have numerous devices and applidising. These articles must, of course, first be demonstrated to be safe to use. This feature is amply taken care of by way of the A. G. A. Appliance Testing Laboratory. Next, the company through its merchandising manager must be convinced that the article can be sold, not only with a legitimate profit, but also to the mutual satisfaction of the customer and itself.

As far as not wanting to "hold the bag" exclusively is concerned, the merchandising manager is quite within his province. He is more than willing to cooperate, but any inventor endeavoring to sell him a device must make up his mind that he should team-up with the requisite advertising. Further, he should know that it takes time to pass judgment on the merits and salability of an article.

Your average gas merchandising manager is correct in not taking chances on every new device that comes along.

What To Do

THE COMING TWO MONTHS with their vacation aspect will see a slackening in the work incident to the carrying on of gas utility activities. At such times there is offered ample opportunity for trotting out and currying down your pet hobby and seeing whether it is hardy enough to weather through.

How about that scheme you have been pondering over for the last several months for facilitating the work of the bookkeeping department? July and August furnish a good time for brushing it up and explaining it to your superior. Or perhaps you have been nursing a prime idea for "cutting corners" or saving on some operation in the plant or distribution department. Plan to give it the acid test during the Summer, when you have a slight breathing spell from the regular hustle and bustle.

There is plenty to do in the gas utility business; still numerous opportunities for saving which are waiting to reward those who have imagination and gumption to think them out and put them into practice.

With all due consideration for the slowing up effect of the heat of Summer, try and do something that will benefit yourself and your company as well during July and August.

THE GAS PLANT AT ALBION, MICH.

A—General view of gas plant showing installation of "unit type" ovens, oven shelter, coke pushing machine, coke quenching wharf, screening plant and coke distribution track.

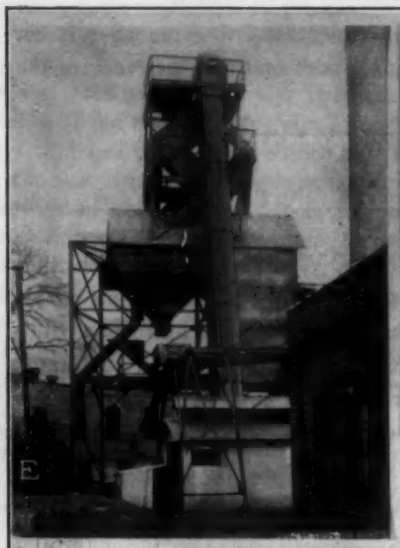
B—Outdoor two-section purifier and meter house. Note welded connections and specials on pipe lines.

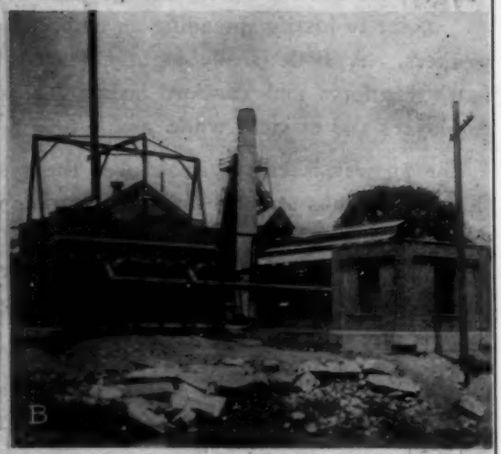
C—Pusher side of ovens showing single-spotting coke-pushing machine in place.

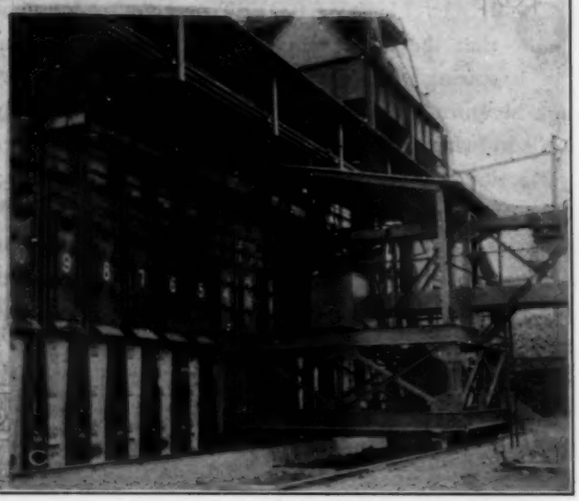
D—Discharge side of ovens showing door machine and coke guide in place, coke-quenching wharf, finger gates and overhead quenching pipes.

E—Belt bucket elevator, screening plant and coke receiving hopper, industrial coke car, and coke-breeze and wagon-loading chutes.

F—Specimen of coke taken from the first charge. Average size is about 4" x 4" x 6". The coal used was 100 per cent Black Mountain.







Miniature Coke Ovens to Serve the Small Community

The Improved Equipment Company ovens as installed in Albion, Michigan, suggest interesting possibilities for coal-gas making in small cities

By R. S. McBride

Consulting Editor, American Gas Journal

A MINIATURE oven would seem to be a suitable designation for the units of the small coal-processing plant which has been built at Albion, Michigan, by The Improved Equipment Company. These ovens are, indeed, coke ovens, for they are equipped with coal and coke handling, charging and pushing equipment, exactly after the fashion of the big oven which makes metallurgical coke; but the equipment is all in miniature. This type of plant, because it makes available a gas-manufacturing unit which also produces real coke, offers interesting possibilities for the small works. In the case of Albion, the plant was chosen because it required small ground space, was simple and flexible in operation, and could be handled with a very small amount of labor of the ordinarily unskilled type.

Oven Arrangement

The initial installation at Albion consists of a battery of ten ovens, two more are to be added this summer, and arrangements are now being made so that a total of sixteen ovens will form the ultimate installation. The coal chamber of each oven is approximately 12 inches wide by 10 feet long and the coal mass as charged is approximately 5 feet high. The capacity is 2,500 pounds per charge of coal of ordinary bulk density. With 12-hour coking periods, 2.5 tons of coal is processed per day in each oven.

The coal for this plant is dumped directly from coal cars on the company's siding to a small track hopper which feeds into the bucket conveyor used for transfer of the coal. The bucket of the conveyor is so arranged that it will slide down large wooden timber guides directly under the track hopper and thus be filled directly from the coal car; after filling thus it is elevated and run along the track supported on a large "A" frame to the desired point of discharge. Whenever feasible the coal is thus conveyed directly to the hopper for use in the plant, to avoid rehandling.

The coal from stock pile or from cars drops through a small hopper onto a belt conveyor which feeds the coal crusher. After reduction to a maximum of an inch and a quarter by this twin spike-roll crusher the coal passes into the boot of the elevator which lifts it into the overhead storage bin at one end of the battery. From this point it drops by gravity into a two-hopper electrically operated larry from which it is charged into the oven through twin charging holes, in much the same fashion as is customary for any large oven system.

Battery Heating

The ovens are fired with producer gas which is generated by a pair of Doherty "Fuel-Economizer" furnace producers built directly on one end of the battery in such a fashion that the refractory work is practically integral with the battery structure. These producers are fired with coke which is charged into the top of the producer at the same level as the charging holes of the ovens themselves. Two producers have been installed, but one has proven more than sufficient to furnish the heating gas for the present battery, and it is thought possible that a single producer may be sufficient even when the full battery of sixteen ovens has been completed.

The fuel gas passes from the top of the producer down into the flues which run lengthwise under the battery, supply the fuel-gas flues under each oven. Air is taken in through each of the recuperators, one of which is provided for each oven. The preheated air and hot fuel gas meet at the flame ports in the base of the vertical heating flues and combustion takes place upward through these vertical channels. The products of combustion then pass across from the flame flues into a smaller number of flues parallel to them in the same wall and downward through this second group of flues into the recuperator passages where they give up their sensible heat to the incoming air.

The battery has eight heating flues in each heating wall and this set of flues serves the two ovens adjoining. The system is so designed that the flames can burn upward in either five or six flues and the products of combustion be carried out through the remaining two or three flues. It was expected that five flame flues and three out-going product flues would be the preferred combination, but experience

at this plant indicates that six heating flues and two out-going products flues serve better. It should be noted that all of the out-going products flues are at one end of the heating wall, but that these out-going flues are alternately at the pusher side and the coke side of the battery in alternate heating walls along the length of the battery.

It might be thought that this system of heating without reversals would provide unequally for the different portions of the oven wall. But the engineers who have been adjusting operations at the Albion plant state that no difficulty has been experienced in securing and maintaining the requisite uniformity in temperature along both the length and the height of each of the heating walls.

Changes in Gas-Making Rate

The battery has been so arranged that if desired for any reason to make a larger ratio of coke to gas it will be possible to fire the battery with oven gas. To do this, finished city gas will be withdrawn from the storage holder and mixed with the proper proportion of stack gas to produce a mixture of the same heating value per cubic foot as the producer gas normally employed for oven firing. This lean mixture will then be introduced to the fuel-gas flues under each heating wall through a pipe line along the face of the battery on the pusher side. The reason for using a mixture of oven gas and stack gas rather than oven gas alone is to make it unnecessary to readjust the proportions of preheated air and fuel gas within the battery. Since no readjustment of that character will be required the shift-over can be made on one or more ovens at will with no delay. To change over completely it will only be necessary to shut off generation in the gas producer and open the gas valves on the fuel lines.

Such change in heating gas is, however, not expected to be required in Albion under any conditions now anticipated. In order to vary the gas output it is more practical to change either the time of coking or the number of ovens in operation, or both. It is possible, for example, to lengthen the coking time and almost proportionately decrease the quantity of gas made by proper temperature adjustments; or one or more ovens can be shut down completely.

Shut-Down of Single Ovens

The shut-down of one or more ovens while the balance of the battery is in operation is made possible in this installation by the use of a design which provides properly for expansion in the inter-oven spaces. At numerous places where the ordinary oven provides a solid brick arrangement a double or split brick arrangement is used in this battery so that the refractory of one oven may move relative to that of another without rupture of the structure. This appears to be a very effective arrangement, for at the time of the writer's visit to the plant one oven was almost cold and the adjoining oven was being operated at so low a temperature that the coking time was approximately 24 hours, because the heating was taking place from only one side of the charge. The other ovens were at full heat for 12-hour charges.

Such a system provides for flexibility in output which is ordinarily lacking in coal- gas equipment of the oven type. Moreover, it appears possible to go from full capacity operation of one or more ovens to practically no gas production within a 24-hour period, or to bring up an oven which is merely maintained at a very dull red heat to full operating temperature within a like period. However, experience has not yet been gained to indicate just how fast these changes can safely be made nor exactly what the effects would be on the structure. It is believed by the erectors that no structural difficulties will result.

Crude-Gas Handling System

The gas offtake at one end of the oven roof follows very closely the typical coke-oven form. The raw hot gas passes vertically through the metal offtake and by a crossover into the "dip pipe." A liquor spray is placed in each crossover, which serves to flush tar and pitch out of the pipe and to maintain the valve and valve seat on the dip pipe in proper operating condition. A steam jet is placed in the offtake at such a point that it will assist in carrying crude gas out of the oven into the collecting main during the time of leveling of the charge. By use of this steam jet the typical outrush of crude gas and smoke through the leveling door and the oven charging holes can be completely eliminated. This is especially important when charging a high volatile rich coal into particularly hot ovens.

A generous quantity of flushing liquor is circulated through the collecting main and several liquor jets are placed along the main directed toward its lower end in order to maintain sufficient flow to prevent accumulation of pitch or carbon. The level of the liquor in the main is controlled by an overflow at its lower end, but the outlet can be opened at this point by simply lifting a valve from its seat. When this valve is lifted the liquor can rush out of the main, and this operation is carried out occasionally in order that the rapid flow of the liquor may thereby insure removal of any large pitch or carbon accumulations that would not normally flow to the outlet with the usual rate of liquor movement.

The circulating liquor passes into a tall steel displacement tank in which gravity separation of the tar and liquor occurs. The liquor required for recirculation is drawn out from the top of this tank and forced through liquor sprays by a small electrically-driven centrifugal pump. The tar overflows from the tar leg of the displacement tank by gravity into the tar settling tank where further separation from liquor occurs. The strength and volume of the circulating liquor is kept at the desired point by addition of a suitable amount of make-up water into the top of the displacement tank.

Cooling and Purifying

The gas in the collecting main is maintained at almost exactly atmospheric pressure. This foul gas from the collecting main passes from the battery to the condenser room where it passes in turn through the primary water-tube condensers, the rotary exhauster, the P. & A. tar extractor, the water-spray

scrubber, and thence through the Root rotary displacement meter, the outdoor oxide purifiers, and finally into the 300,000 cubic foot welded storage holder from which it is distributed to the city. The Western Gas Construction Company has designed and built the equipment in this gas-purifying house and the electrically-welded multiple lift holder, which is the first of its type built in the United States. The two-section oxide purifier was built and erected by the Steere Engineering Company. It is of interest to note that in all of this gas-handling equipment welding has been used wherever possible. The shell and connections of condenser, scrubber, purifiers, and other equipment are all welded except where necessary to have flanged joints in order to facilitate connection or removal of valves or the opening of lines for cleaning or maintenance work.

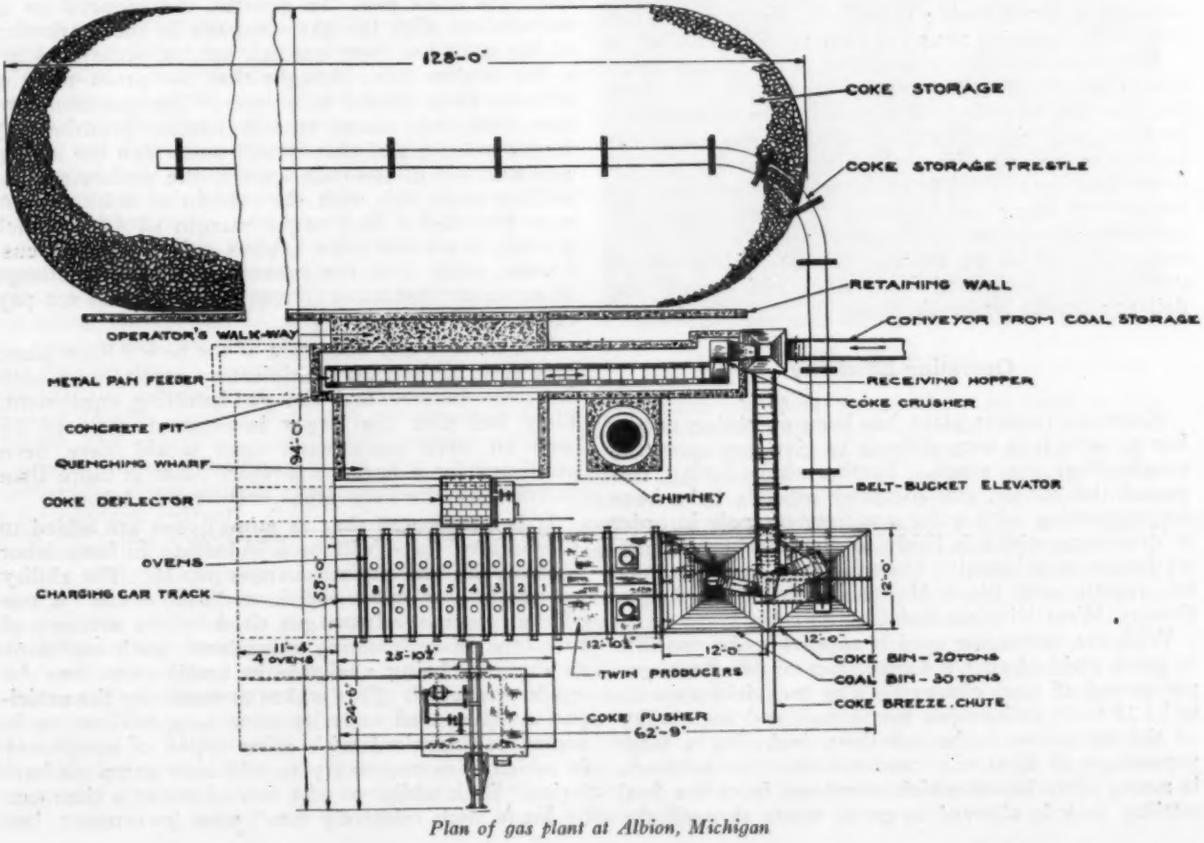
The only building of any size required for this plant is the single-story brick structure about 30 by 65 feet which contains in separate rooms the condensing and scrubbing equipment, the boiler plant of two 75-horsepower boilers, the shower and locker room for the workmen, and the plant office. The station meter is separately housed in a small structure adjoining the purifiers and the governor house in which is the equipment to control the pressures on the town adjoins the large storage holder which is located across a small creek from the main plant.

Mechanical System

When a charge has been completely carbonized the two oven doors are removed and the coke is pushed from the oven, exactly as in larger types of ovens. However, the equipment used in this plant is novel in many particulars. The pusher requires only a single spotting for the entire operation of door removal, pushing of the coke, replacement of the door, and leveling of the next charge. The door removal mechanism is of novel form, which permits lifting of the door from the oven by the face of the ram and transfer onto a small door holding rack which is then moved to one side out of the way during pushing of the charge. The mechanism for this movement of the door is particulary ingenious because after the door is pulled back by the ram a single continuous operation in one direction of the operating wheel lifts the door onto its carrier rack and moves it laterally out of the way. And the reverse operation for replacement of the door is equally simple.

The door machine and coke guide on the coke side of the battery is manually operated without any electric motors, but all of the system is so geared as to make the handling of the light car and the removal and replacement of the doors a very easy task. The pusher is electrically driven by a single motor with a multiple clutch system which provides for movement along the track, driving of ram, and movement of leveling bar. The doors themselves are arranged with metal-to-metal contact between the door and the frame and no mud is used for luting.

All of the structure above the oven battery, including the track on which the coal-charging larry car runs, is supported on the structural steel which constitutes the buckstays of the battery. Moreover,



Plan of gas plant at Albion, Michigan

the foundations under the track for pusher and for coke cars are both independent of the battery and its foundation. This scheme was chosen in order that none of the mechanical operations of the heavy machinery would in any way throw strains on the refractory structure itself.

Coke Handling

The coke is pushed from the oven through the coke guides directly onto the wharf. It is quenched there by manually controlled, but automatically timed, valves operated by the coke guide man. A separate spray nozzle is so placed over the wharf as to cover the charge from any particular oven, the nozzle being positioned exactly where the center of the charge is likely to fall. When necessary, hot spots remaining in any lot of coke are quenched by hand with a hose, but this is rarely necessary to any great extent.

At intervals the coke is withdrawn from the wharf through well balanced gates onto a pan conveyor which carries it into the hopper of the coke crusher. This is a double-fluted roll machine which breaks the coke down to form domestic furnace size as the largest product.

From the outlet of the coke crusher this material flows to the boot of the same elevator as is used for elevating the coal into its bunker. The coke is passed over a series of cascade lip screens which deliver it into the proper bins, egg, nut, and breeze being the three sizes separated. The egg and nut coke are stored in two bins which adjoin the overhead coal storage bin and the breeze is carried through a chute beside these bins down to a stock pile on the ground near the battery.

The coke required for producer firing is withdrawn from the bottom of the storage bins into a small car for charging into the producer or it may be conveyed by a chute to trucks which drive along the end of the battery in order to lead directly by gravity for delivery into the city. That coke which is not required for battery firing and is not to be taken directly to customers is carried to the stock pile by hand-operated coke car on an elevated trestle. This coke is subsequently reclaimed from stock and loaded into delivery trucks by hand.

Operating Efficiency

Since the present plant has been operating only a few months it is very difficult to give any operating results that are exact. Furthermore, during this period the Albion gas company officials have been experimenting with quite a variety of coals in order to determine which is likely to give the best results, all factors considered. Thus far they have obtained fair results with Black Mountain, Kentucky, Logan County, West Virginia and Chilton coals.

With the best coals used it appears to be possible to get a yield of nearly 6 cubic feet of 540 B.t.u. gas per pound of coal charged. The tar yield appears to be 12 to 13 gallons per ton of coal, and the quality of the tar seems to be excellent, including a large percentage of light oily constituents. No ammonia is made. The liquor which overflows from the final settling tank is allowed to go to waste through the sewer. Disposal of ammonia at this works is still a problem, because apparently it is not worth while to recover the production, which at the present time does not exceed approximately 150 pounds of NH_3 per day.

Although the sales of gas in Albion have been increasing very steadily, especially among the small industrial plants, there has been no difficulty in prompt disposal of the coke. It is expected that even with considerable further increase in gas market all of the coke made can be sold locally.

At the present time the total coke made is approximately 65 per cent of the coal charged; of this, 4 to 5 per cent is breeze, which is burned in the plant boilers. There is approximately 300 pounds of coke used for producer firing per ton of coal processed. There remains for sale, therefore, approximately 950 pounds of coke per ton of coal treated. All of the coke is marketed by local fuel dealers. The price charged to the retail customer is approximately $9 to $9.50 in the summer and $10 to $10.50 in winter. This price is much lower than that for anthracite in order to meet the very active local competition of Pocahontas coal which is popular for household use. The gas company gets from the coke dealer $6.75 to $7.75 per ton, according to the season.

Trucks Loaded Gratis

In all cases the company will load the dealers' trucks without charge when coke is available in the bunkers above the battery, but the dealer is required to load his own truck if the supply must be taken from the stock pile. In general, the cooperation of the dealers with the gas company in the marketing of the coke has been cordial, but on occasion some of the dealers have thought that the profit margin afforded them should be greater. The gas company has, however, stated that it cannot promise any larger margin and that it will undertake the selling and delivery of the coke itself if the dealers are not willing to do this with the margin of $2.25 per ton now provided. The larger margin of $2.75 which prevails for some sales applies only for credit customers, since it is the custom in Albion to charge 50 cents per ton more to customers who do not pay cash.

The owners and operators of the new Albion plant have thus far had very satisfactory results with both the oven battery and the gas-handling equipment. They feel that the larger investment required by such an oven installation than would have been necessary for a horizontal-retort plant is more than justified by the very great economy in labor.

It is anticipated that as more ovens are added to the battery there will be a reduction in both labor cost per M, and capital charges per M. The ability to add one or more additional "unit ovens" is one of the principal advantages cited by the erectors of this type of carbonizing equipment; such additions to capacity being available in small units may be made as needed. This makes unnecessary the anticipation of needed capacity over long periods as is sometimes required with other types of equipment in which it is customary to add only complete batteries. Such additions of a few ovens at a time can be made with relatively small new investment, be-

cause coal and coke-handling equipment as well as gas-handling apparatus does not need to be increased if originally properly designed for the larger plant.

It is estimated by the engineers of The Improved Equipment Company that the initial cost of unit ovens with their immediate requisites for handling coal and coke is approximately 30 per cent greater than the cost of a small horizontal hand-charged retort plant of equal capacity. However, additions to capacity such as are proposed for Albion can be made with unit ovens at an estimated cost of four-sevenths of the probable investment for equal additions in retort capacity. The greater initial investment in ovens as compared with retorts is more than offset, under most circumstances, by savings in plant labor, it is believed by the erectors. They estimate total plant labor as typically about 85 cents per ton of coal processed with an oven plant like Albion, in contrast with approximately $1.50 to $1.65 per ton for a retort installation of the same capacity. Furthermore, they believe that labor costs per M are practically constant with increasing retort plant capacity, but decrease almost proportionately with increasing oven plant capacity. This last fact is very important as offering an inducement to take on additional industrial gas business at low wholesale rates.

The present plant, and presumably the enlarged plant of 12 to 16 ovens, is operable by a plant force totaling five men. One man on each of the two shifts serves as pusher man. A second man on each of the two shifts serves as coke man and also takes care of the charging of the coal.

These two men on each shift really work less than ten hours, but they are on duty available for service twelve hours. They take care of all plant operations between removal of the coal from the storage bunker to placing of the coke in its storage bunker, including firing of boilers, supervision of purification, reading of meters, and watching of condensing and scrubbing equipment. A fifth man, who is on day shift, unloads coal, manages coal crushing and elevating into the battery bunker, and is handy man for all sorts of miscellaneous jobs about the plant. The only other man who has any responsibility about the plant is the plant superintendent, who oversees all operations, supervises maintenance of battery heats, makes the necessary records of meters and control apparatus, and directs plant work. This same superintendent is also in charge of the distribution department and supervises main laying, service work, and other problems throughout the city. His time is apparently about equally divided between works and distribution system.

It is evident that the Albion Gas Light Company has made a very favorable impression on this community by the installation of this new plant. In referring to this undertaking the local newspaper, apparently reflecting local opinion, points with pride to this evidence of "a distinct new era in this city's government." It appears very clearly that the local management has, as this same editor remarks, proceeded "to give Albion a gas manufacturing plant that would be up-to-date in every respect and capacious enough to care for the future expansion of this city."

Sandblast Beats Brush and Shovel

By Frank H. Williams

IT IS general practice nowadays to recondition gas mains ahead of street improvements so as to obviate the necessity of later tearing up pavements. In reconditioning the earth is removed, the pipes disjoined and sections removed to the central storeroom where the pipe was laboriously cleaned with shovels and wire brushes. To replace the section removed, wrapped pipe was put in its place.

All this, in addition to being a long and expensive job, did not give a clean surface upon which to later apply a primer paint and subsequent asphalt and paper covering. It was found that the whole process was too expensive so experiments were started in cleaning and wrapping the main while still in place, provided corrosion had not penetrated too deeply. Methods of field wrapping were developed successfully, but trouble was experienced in developing an economical and efficient method for cleaning.

Sandblast in operation

A certain job came up for the Los Angeles Gas and Electric Corporation wherein the pipe had screwed coupling joints and these were badly corroded and leaking. It was desired to weld them. However, wire brushing did not clean the surface sufficiently so that the metals would fuse and a sand blast was resorted to with great success.

The surface left after sand blasting is not only clean but is also roughened, which causes subsequent applications of primers and asphalts to adhere tightly. More than all that, the pits are thoroughly cleaned out and can be carefully inspected. Pits which are penetrated to a degree thought dangerous are built up by oxy-acetylene welding.

The cost of cleaning by the sand blast method is successful and much lower than that of any other method tried to date and the equipment has great portability.

The Gas Man Comments on the Subject of Pensions

PENSIONS MAKE FOR EFFICIENCY

By Charles M. Cohn,

Vice-President, Consolidated Gas, Electric Light & Power Company of Baltimore

IN his article Mr. J. J. Berliner has expressed himself clearly and interestingly on the benefits to be derived from well-considered plans for handling the problems of the superannuated employee. The data which he presents, and his conclusions as well, indicate the doubtful value of the pension system as an expedient for increasing the personal efficiency of the employee or even effecting reductions in labor turnover. In line with his opinion, our people of the Consolidated Company in Baltimore feel that the best function of the pension system from the company's standpoint is to stimulate the natural and normal flow of promotion within the ranks of the organization and to insure that the carrying on of the utility's activities shall be in the hands of vigorous and capable persons. This condition speeds up the organization.

In the May, 1928, issue of the American Gas Journal there appeared an article, "Pension Systems," by J. J. Berliner, which discussed the subject from a general standpoint.

The present symposium should be of considerable interest, since it represents the mature thought of several men in the industry well qualified to handle this phase of gas company affairs.

The problem of laying aside the old and faithful employee whose advanced age has impaired his usefulness is not an easy one to solve. In fact, it is often found so difficult of solution that executives will retain or permit to be retained aged and usually inefficient employees out of sheer good-heartedness. This condition slows up the organization.

Without the existence of the pension system it is difficult to criticise this humane attitude, notwithstanding the lack of effectiveness which it may entail. Nor would it seem a remote assumption that a department head so constituted that he can discharge the old employees ruthlessly and with a view only to the efficiency of his working force, might prove to be steely-hearted in other and perhaps more vital respects. The operation of a pension plan is therefore a facility for the executive or department head, as it relieves him of the compunction engendered by the dropping out of his old fellow-workers without any provision whatsoever for their continued sustenance in the declining days of their lives.

The pension plan of the Consolidated Company was not formulated upon the actuarial basis so highly recommended by Mr. Berliner, although, generally speaking, the advantages of such a basis in some instances may be as definite as he asserts. However, it seems to us that local conditions affect the operation of the pension system as established. The rapid growth of the Consolidated, with large yearly influxes of new and comparatively young employees, has tended to keep down the average age of the organization and stabilizes the ratio between the annual cost of the pension system and the total payroll expenditures of the company. Our experience with pensions, which dates from 1912, has not, therefore, as yet demonstrated a burdensome growth in ratio of the cost of the system, as suggested by Mr. Berliner's article. In fact, the ratio has been fairly constant.

Our system has worked well. It has not proved burdensome and it has been greatly appreciated by those employees who have reached the age where termination of employment might otherwise create a grim spectre to disturb their remaining years. In establishing its system, the company made it known that no contractual rights were afforded employee or pensioner; that the pension system would continue to operate only so long as the management of the company deemed advisable. Our experience so far fully justifies its existence and indicates its permanence. Perhaps we, too, may find from further experience the desirability of placing it upon an actuarial basis. We know it has not yet gotten out of bounds nor will it do so during the next decade. We keep a close check of the situation and no alarming symptoms, as suggested by Mr. Berliner, have developed.

JUDGMENT VS. MATHEMATICS

By Felix B. Streyckmans,

The Peoples Gas Light and Coke Company, Chicago

THE views held by those concerned with the Peoples Gas Light and Coke Company pension system are in accord with Mr. Berliner's presentation of fundamentals on that subject in the May issue. The benefits of such a system are many and so intangible that most of them cannot be weighed. Yet they are real and together seem well worth the cost.

The ramifications of a pension system, too, are many and extremely complex. Much intensive and specialized study is required to inaugurate a system that will not play queer tricks in future years.

Certainly the "peak" is elusive. No warning on the distant visioning that may be required to keep

maturities within the limits of "payability" as time goes on can be too strongly sounded. This, though, is limited to what may happen—and what may happen is just as likely not to happen.

So it seems that a warning is about all that can be given; there is no formula which, if followed, will guarantee any set amount at any given future time. A slide rule may help, but how much depends upon a number of factors. The instrument which would most nearly approach the requirements would be the crystal ball.

The rolling snowball descending the hill starts out with one set of dimensions which vary as it progresses. Its size from time to time depends upon the angle of the incline, the speed at which it started, the original size, the covering of the ground, the temperature of the air, and the possibility of wind, rain, sun and more snow.

The increase in maturities of a pension system are no more set. Yet they are in some degree more practicable of estimate. But the estimate should be based upon conditions within the company which vary just as the conditions under which each snowball rolls are never the same.

To make deductions from what is happening in one company and construe them to indicate what may happen in another company is dangerous. The electric light and power company and the gas company which serve Chicago co-operate to the ultimate in giving each other the benefit of research. Yet, none of the figures and estimates that one company uses in its pension system are used by the other, although they are considered.

The only safe way to inaugurate a pension system is to have a competent actuary work with an intelligent member of the company, using mortality data and the figures available from the statistical and employment departments of the company concerned. Judgment must be mixed with the figures that the past provide to determine future curves. And that judgment can be had only from the minds of those within the company who know the circumstances surrounding past events and the probability of those circumstances continuing.

The trend should be analyzed at frequent periods and new forecasts made. The sum of the results of these periodic surveys will give the then current trend.

But the problem requires as much judgment as it does mathematics. The possibility of a sharp curve continuing is more significant than the curve itself.

Hence the need for confining research, after securing outside talent, within the experience of the company for which the system is provided.

STUDY SHOWS NEED OF CAUTION

A Comment by the President of a Large Gas Company Group

WITH the rather hectic development of this country in the past ten years, and the very largely increased earnings of our working people, the temptations to spend those earnings before they are acquired, or, as the common parlance has it, "to mortgage future earnings," sometimes for years ahead, has, of course, made the question of pensions even more a matter of interest to men and women dependent solely upon their wages than ever before, but a pension system that is not thoroughly safeguarded, I think, is a very serious menace.

In the gas industry, especially with those companies that have been under one management for a great many years, you probably have a higher percentage of older men than in most other comparable industries, and the cost of establishing a pension system on a permanent and safe basis during the first years, is very heavy, and, unless conditions change very materially in the next twenty years, there isn't anything to make one believe that such a cost is going to materially decrease.

I have made some study of some of the pension systems that are in effect, and have some proposals which we have been considering. The result of that study has taught me enough about the difficulties and the problems connected with the establishment of a safe and permanent pension system to know that I do not know much about it, and to have no desire for offhand opinion on the general subject.

WOULD WELCOME A PROPER SYSTEM

By Hilmar Papst,
Vice-President, Portland Gas & Coke Company.

THE company under my management has no systematized pension plan in force, but the company has always felt that from a humanitarian standpoint something should be done to their old employees, irrespective of the number of years of service. We, therefore, whenever an old employee is retired, allow him a monthly salary based on 50 per cent of his previous average monthly salary during the last ten years. This retirement still allows him to come under our accrued life insurance plan, which we adopted about two years ago. The average number of employees on the retired list is from four to six.

With reference to Mr. Berliner's article in the May, 1928, issue of the American Gas Journal, I fully agree with his statements, namely, a pension system does not reduce labor turnover, nor increase the efficiency of the active force; these two important items have been handled by this company by creating an incentive through increased wages, known as the premium system, and found very satisfactory.

Personally, I should welcome a system of pension worked out by one of our large insurance corporations, similar to our plan in force for group insurance, where both the employee and company contribute, in order to take care of those employees when old age overtakes them.

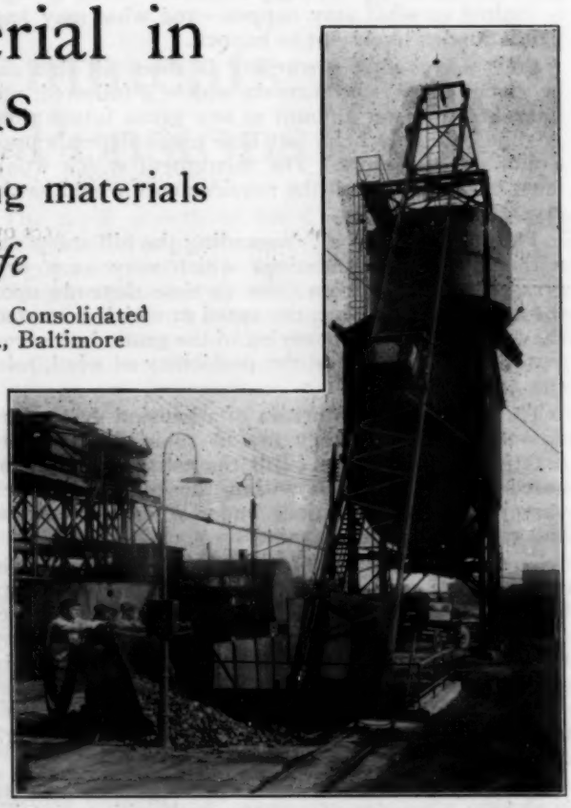
Handling Material in Gas Works

Part II--Ashes and purifying materials

By John H. Wolfe

Superintendent Gas Manufacturing, Consolidated Gas, Electric Light and Power Co., Baltimore

IN the handling of ashes many systems are in vogue. Among them are the use of industrial cars, carts or trucks, belt conveyors, bucket conveyors, skip hoists, steam jet conveyors and hydraulic sluicing systems. Of all of these the last appears to be the most promising. The various pieces of equipment may be used singly or in combination to achieve the desired result. The use of cars, carts and trucks involves the use of a certain amount of labor which in some cases cannot be avoided. Belt or bucket conveyors require a considerable amount of space and are not generally satisfactory when handling very hot ashes. Skip hoists will elevate but are difficult to arrange for horizontal movement. Steam jet conveyors are wasteful of energy and are high in maintenance. The hydraulic system has many advantages and rapid progress is being made in the art so as to reduce the energy requirements and maintenance to a minimum. The amount of space required for the sluices or ducts is very small, and the ashes may be pumped to overhead bins for ease of removal. The large sizes of ashes must be broken up in order to handle them on almost all of the systems mentioned above. This is particularly the case with the bucket conveyor, the steam jet conveyor and the hydraulic sluicing systems.



Fuel recovery plant. The ash and fuel are dumped from industrial cars into a hopper which discharges to a skip bucket. The skip feeds the storage bunker. The bunker discharges onto a reciprocating feeder and then to a double decked screen, oversize and fines going into the ash bunker below. The middle-sized material is hand picked to remove the clinker and ash and is stored in the end of the lower bunker. Ash and fuel are removed by trailers and trucks

Necessity for Ash Quenching

In the event that it is necessary to handle hot ashes by any of the systems except the hydraulic sluice, it is necessary to promptly quench the ashes as soon as they are removed from the apparatus, otherwise serious damage to the conveying equipment will result.

The most important factor to keep in mind in choosing conveying and storage equipment for ashes is to guard against corrosion. Although many new corrosion resistant alloys are appearing on the market every day, most of them are too expensive to use in such large quantities as would be required in conveying systems. There are a few, however, which are low in cost and which give great promise of maintenance reduction. Chilled cast iron and high carbon steel plate will resist wear and abrasion and also corrosion to some extent. In lining chutes, feed hoppers, and storage bunkers of steel, glazed tile or vitrified brick may be used. These must be set in a bitumastic base in order to resist corrosion as well as wear, otherwise the steel will be attacked at the joints between the tile or brick. Concrete and cast iron plate bunkers are often used for ashes and are very satisfactory.

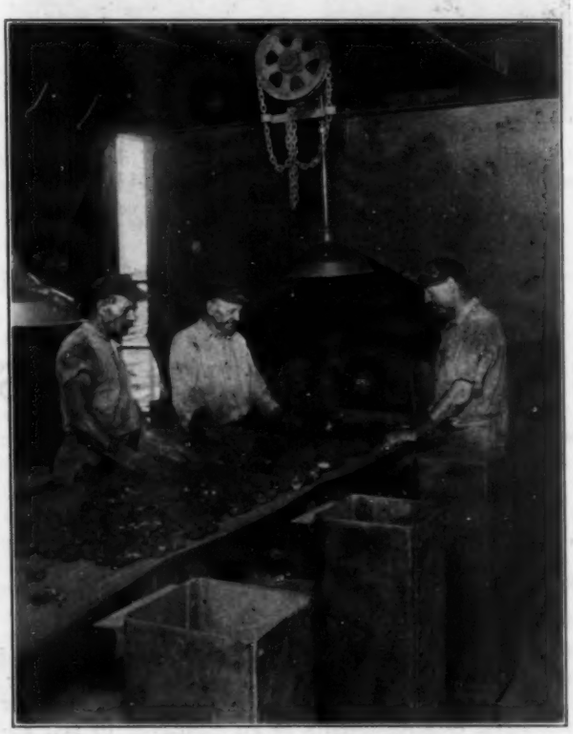
Separation of Carbon From Ash

Although great progress has been made in Europe in the separation of carbon from ash for return to the combustion or gas-making process, advance in this country has been rather slow. The main reason for this, of course, is that fuels are very expensive with them and must be conserved, while with us the point of economy for cost of installation plus cost of operation and maintenance, versus cost of fuel has just about been reached. This is particularly true for boiler fuels. Coke costs have already reached a point with us where the carbon values are worth recovering.

In Europe the flotation type and high intensity magnetic field type separators are both used extensively for reclaiming fuel from ashes. In this country the flotation type is used to separate only the larger fuel from the ash for reuse in water gas sets. One installation of mechanical screening equipment aug-

mented by hand picking has been made. In this, the large fuel is saved by screening and by hand picking the clinker and ash from the coke. The amount of fuel returned to the system when water gas sets are hand cleaned will average between 5 and 6 per cent of the total fuel consumption; the average ash in the recovered fuel running about 30 per cent. With automatic grates no sizable fuel remains for recovery.

In the case of purifying materials the bulk movement of the raw materials may be best accomplished by unloading the iron ore or oxide from cars or scows by means of grab buckets and the shavings by means of hand labor and trucks when in bales, or by air blower or conveyor when received loose. The mixing may be best accomplished by feeding the materials by hand into a concrete mixer, and then stocking by means of a conveyor belt and crane.



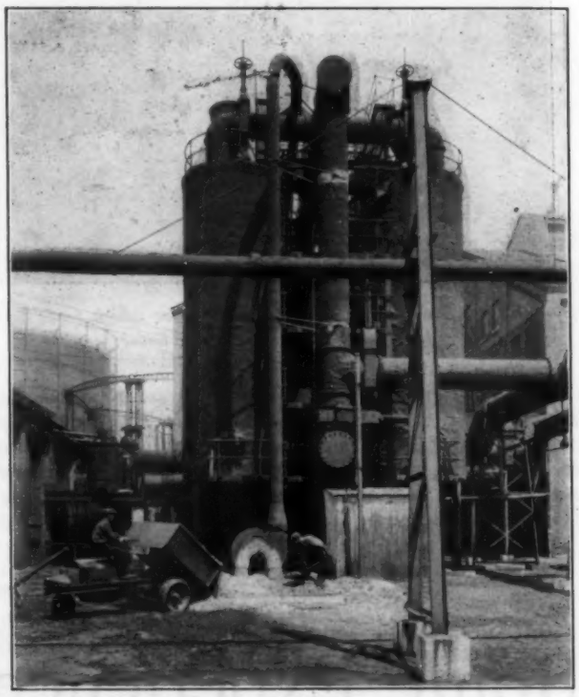
Hand-picking belt on fuel recovery plant. Square chutes for ashes picked out are shown beside picking stations

Soda ash, unless received in very large quantities, can be handled best in bags on trucks. If the amounts are great the loose material can be shipped in bulk to be unloaded and stored by means of an air conveyor system.

Economy of Purifiers Out of Doors

In the operation of the purifying boxes the greatest labor saving can be brought about by placing the boxes out of doors. They can then be unloaded by means of grab buckets operated from man trolleys, or low traveling bridges, or my locomotive cranes. The latter will require the boxes to be set low which may not be adaptable to the local situation in the event that ground and foundation conditions are bad.

Industrial cars hauled by small engines or tractors should be loaded direct with the fouled material by the grab bucket. The bucket should be arranged to pick up the fresh or revivified material from hoppers



Air blower system for elevating shavings into shavings scrubbers

alongside the boxes, these to be fed by the same system of cars.

If it is necessary to place the purifying boxes in buildings, the fouled material must be removed by hand and dumped, preferably by gravity, by placing the boxes on columns, into cars, carts or trucks. The fresh material may be placed to best advantage by utilizing an overhead belt conveyor and tripper. These are fed by a belt and bucket elevator receiving its supply from a hopper located outside of the building.

The work of removing the fouled oxide from the box may be facilitated by placing in the box, at the time of filling, round, tapered, wooden timbers which may be driven down and taken out when dumping and which will open a channel for removing the oxide. Pneumatic tools may also be used to advantage in removing hard, fouled oxide.

Versatility of Yard Crane

In turning, stocking and revivifying oxide the most satisfactory piece of equipment is a yard or crawler type crane. This equipment can be used for so many other purposes that it is well nigh indispensable around a plant. Various types of bucket loaders have been tried out by the writer but experience has proved that they are either equipped with the wrong type of feeding device to handle all classes of materials, or they are so constructed as to cause

maintenance costs to run high in operation. They are primarily "one purpose" machines and therefore do not fill the requirement of flexibility.

Dumping fresh or revivified oxide into hopper which feeds belt and bucket elevator in purifier house

The yard crane, crawler type, full swing, is about as useful a piece of equipment for handling materials of all sorts at all locations that a gas man can have in his possession. It may be operated either by steam or by a gasoline engine. Its general utility is unquestioned.

In drafting this article the writer has attempted to present, based on his experience in designing, operating and maintaining conveying systems, the main features which should be given consideration when purchasing material handling equipment.

It is hoped that the information will be of assistance to gas operators and engineers, and that, by its use, difficulties which often arise with conveying systems, may be avoided.

Mixing iron oxide, shavings and lime for purifying material in motor-driven concrete mixer. Portable belt conveyor may be used for stocking or loading the finished product

Some Experiences in Industrial Gas Survey Engineering

By G. W. Allen,

Industrial Survey Engineer, Toronto, Canada

IT IS not the intention of the writer in a paper of this kind to bring out anything remarkably new along the lines of Industrial Gas Surveys, or even to enlarge on any phase of this interesting work that may be already known to the gas men present with us today.

There are, however, some features in connection with this work that may, on the other hand, be of interest, particularly some of the things that have been revealed to the writer while making surveys of this kind in several Canadian cities.

You have already been told through papers delivered at this and other association conventions of the value of industrial surveys, and that the time had arrived when gas companies must place their industrial departments on a sound business basis in order that plans may be laid for the expansion that is rapidly taking place in this field of gas utility.

Personal observations have revealed that but few gas companies have gone about the development of industrial gas sales, other than the ordinary method of advertising the advantages of gas as a fuel, or, through salesmen calling on factories and other industrial establishments in an endeavor to sell appliances. In most cities there is not even one person employed by the gas department or company who is in a position to accurately advise a manufacturer what gas can do for him in his shops. Personal investigation has revealed a startling lack of information on this subject of industrial fuel on the part of men whose business it ought to be to create larger outlets for gas.

However, as time goes on, we are beginning to see an awakening along these lines, and managers of gas plants are beginning to take hold of the industrial work in a way that promises success to their endeavors.

Like any other business, we have reached a point where it is absolutely necessary that we demonstrate what our product can do for those people willing to use it, and in my own experience, while lately in personal contact with over 689 industrial and commercial firms, it has been revealed that almost 90 per cent of the business heads of these

Read at the annual meeting, Canadian Gas Assn., June 21-22, 1928, Hamilton, Ont., Can.

establishments are quite willing to use gas in their varied heating operations if the gas companies are willing on their part to demonstrate its possibilities as a fuel.

Personally I think the attitude of the manufacturer is quite a sane one, for if we have faith in what gas can do under certain given circumstances we ought to be willing and ready to demonstrate the fact.

There seems to have been too much of the "waiting for customers to come and buy" attitude expressed by our gas company friends, and while some have come to realize the truth and are taking steps to remedy it, on the other hand, many are still doing but very little to get the business which, after all, is the only kind of business that will ever assist us to reduce gas bills.

One good average industrial customer is worth or equal to 500 or 1,000 domestic customers. Obviously the overhead, all things considered, is much less on one wholesale consumer than on the larger number of domestic users with their small monthly demands.

To make a detailed survey of all the processes now carried on in the business houses of four of our Canadian cities within the past two years, and to report on the possibilities of applying gas fuel to each of the heating operations revealed in the 689 establishments visited, is a work of considerable magnitude and importance, and some of the things brought to light ought to have a measure of interest to each of us engaged in this kind of new business work.

That it is an engineering work goes without saying, for, when properly understood, industrial gas surveys can only be successful when carried on by men who have a fair knowledge of every process carried on in industry today.

It is not meant by this that every man following up industrial business should be some sort of superman and understand everything there is to know about industrial fuels, but, it does mean that the man who is employed to make the preliminary surveys, and the manager in charge of the new business department, should have a fair grasp of this important business development.

Object of Surveys

Industrial surveys are expressly for the purpose of revealing new outlets and possibilities for gas fuel, and while at the outset they are not intended to bring about immediate increases in gas demands, they nevertheless become the first steps in the correct understanding of what the local gas man himself is up against in his endeavor to get this business. An industrial survey is then in very truth that which it is expressly intended to be, that is, for the gas manager's own benefit. Knowing what he is up against, he is in a much better position than he otherwise would be to institute ways and means for going after business that is now held by other fuels.

It is practically impossible for any new business manager to have a detailed knowledge of every one of the 21,000 processes now supposed to be successfully carried on with gas as the heating fuel, but this does not excuse him from failure to adopt a system in his own office that would keep him and others posted on what is being done, and in many instances, how it is being done, in other places and institutions throughout the country.

This then is where the Industrial Fuel Engineering Information Bureau comes in. With such a bureau properly built up and constantly supplied with the necessary data and information, it becomes a much easier matter for the manager to handle the subject of industrial heating whenever it does come up for attention.

By means of such a bureau the local manager is in a position to aid manufacturers with their various heating problems, and he is thought more of by these same business men when they see that he has a fair grasp of this important phase of gas sales work.

A Business of Its Own

Industrial surveys have been given considerable thought of late, and industrial survey engineering, if you like to call it that, is becoming practically a business of its own. It has reached proportions of late where it has become a difficult matter to obtain men skilled enough and with courage enough to go out and meet every kind of plant manager, meet him on his own ground, and to be of some assistance to him in his own efforts to increase the efficiency of his production problems.

The writer's experience has proven that local gas companies have gained the greatest prestige in the eyes of the managers of industrial and commercial concerns where and when the gas surveys have been put through by other than their own men. Plant managers seem to lack confidence in the ability of gas company employees to understand their particular heating problems. This is, however, only so in such cities and towns where the local gas departments have never made much effort to get this kind of business, or, who have never acquainted their industrial concerns with the fact that they are willing and ready to cooperate with manufacturers in their various heating processes.

To show the value of industrial surveys I would particularly mention that when all the reports were analyzed covering the heating processes carried on in the shops of four Canadian cities, Kingston, Guelph, St. Thomas, Ontaria, and Sherbrooke, Quebec, there was revealed an actual desire on the part of over 33 per cent of the industries visited to use gas in their processes provided the gas departments were willing to demonstrate what gas could do. About ten per cent of immediate business was also located apart from any rate question entering into the transaction. The only difficuly experienced was in the local company's inability to immediately follow up the business, owing to lack of men properly trained for this important work. However, all these cities mentioned have made or are making progress on the preliminary follow-up required, and have expressed their desire to go right ahead with the establishment of the first step in the plan, that of organizing an industrial fuel information bureau.

The surveys also revealed the fact that but few

of the managers and superintendents of the industrial and commercial establishments called upon were aware of the great strides being made along industrial gas development, nor were acquainted with the modern type of gas heating equipment now obtainable for successfully handling their special line of work.

Relation of Rates and Domestic Load

It was also revealed in a more general survey made recently that the highest gas rates prevailed in cities where the domestic load predominates, and where there is not a uniform demand for gas at all seasons of the year. Cities having the lowest rates in force were those enjoying a fair balance of both lines of business—domestic and industrial.

It is therefore obvious that the gas companies who want the enjoyment of lower rates should take steps toward developing that demand which costs the least to handle once it is obtained—that is, the industrial load.

To accomplish this it is necessary to arrange for a preliminary industrial survey of the possibilities ahead. A survey of this kind reveals all the possible outlets for gas in factories, foundries, machine shops, hotels, restaurants, cafes, confectioners, bakeries, hospitals, colleges and institutions. Individual reports covering each place visited, if properly made out, will show every present heating process carried on in the establishment; will show kinds, quantities and costs of present fuels in use; the various overhead expenses applicable thereto; although even here there is a woeful lack of information available on the part of the operators and managers who in many cases just lump their various fuel costs and cannot definitely state just what an individual appliance is costing in the way of fuel. The individual reports also contain information as to whether gas fuel could be adopted, and at what rate it should be sold supposing that the latest type of equipment available for the process was in use. All the various delays, uncertain results, varying temperatures incidental to fuels at present employed, are also listed. With such reports properly followed up by the local gas department, there cannot help but be a steady increased gas business following.

Newspaper Announcement

In advance of making a survey, some form of newspaper announcement, coupled up with a letter to each manager and plant superintendent, should be gotten out. This should draw attention to the fact that the gas department is about to make a survey for the future benefit of local industry, and with the object of later on bringing about lower gas rates. It is also hoped they will give the visiting engineer the privilege of making an inspection of their heating operations to the end that first hand information may be obtained as to whether gas fuel could be applied to the process to the mutual benefit of both the manufacturer and the gas department. The announcements should also stress the importance of the Industrial Fuel Information Bureau which the gas department is establishing as a means of aiding manufacturers and others to greater heating efficiency in industry.

In the writer's visit to the 689 business establishments already mentioned, he received the greatest of courtesy at the hands of the managers, plant superintendents, master mechanics and others, and every effort was put forth by these men to demonstrate what they were doing with various kinds of fuels, and only in but few exceptions was there any pessimism shown towards gas as a fuel. In the several large locomotive shops visited, the steel and iron foundries, the general manufacturing establishments, the hotels, restaurants, bakeries, dairies and other business houses called on during the surveys, there was expressed a keen interest in the more modern development of gas, and these firms expressed a hope that the local gas companies would soon be in a position to demonstrate the efficiencies of gas fuel.

Our larger gas companies have proven the value of industrial gas business, and these have been the envy of the smaller gas plant, but the smaller towns and cities can do a great deal towards getting some of this business, if they will only take courage and go after it.

Know your field first, and afterwards the way will be made much plainer, but don't forget to learn something about your competitor's fuels and what these can do in an industrial direction.

BURN-GARBAGE-AT-HOME IDEA

Garbage will be burned in each individual home in the future, thus doing away with the collection and disposal of this refuse at public expense, in the opinion of Postmaster Peter F. Piasecki, of Milwaukee.

"Perhaps this suggestion may seem foolish to some or it may be a little ahead of time," said Mr. Piasecki, "but I can see no reason why garbage should not be disposed of in each home more cheaply and more conveniently than by the present method.

"All older residents of Milwaukee remember the days before the city compelled the installation of plumbing and the discontinuance of the use of wells. There was a big protest at the time and many claimed that it could not be done. It does not seem impossible to me that the city may take action in the future which will compel every home to dispose of its garbage.

"There is nothing impossible about such a plan. I have an incinerator in my home, and many if not all of the homes in the block have them. It works very efficiently.

"The cost of installation is small and operation costs practically nothing. There are no odors that I have ever noticed. Every home could have such apparatus.

"The cost of garbage collection and incineration for five years would, I feel sure, pay for individual incinerators for every home in Milwaukee. A fund could be established by the city for buying them in quantities to get the lowest possible price.

"The subject should be taken up and discussed. Milwaukee has led in many things. Here is something the city might do in advance of other cities."—Milwaukee Journal.

Office Methods in Gas Companies

X—Handling papers in auditing department

By G. L. Harris

NOWHERE in the gas company is there likely to be less uniformity in the handling of papers than in the auditing department. Nowhere is the number and variety of papers to be handled more voluminous. And nowhere is the loss of a single paper apt to be more serious, for the papers which come to this department contain figures which represent money.

A view of the centralized files in auditing department of Georgia Power Company. Note that all filing cabinets are standard size

Possibly because of the wide variety of papers and because of the distinctly different functions served by them, it has come to be a practice that each division of the department, and even each clerk of a division, assumes the responsibility for those papers which apply to his work. At least that is the theory on which so many auditing departments allow the clerks to keep their working papers in their desks, permitting them to accumulate until the desk simply will not hold any more.

Where an effort has been made to detail one person to the organizing and filing of papers, we have often seen this duty assigned to the office boy. Nor is this a matter of ancient history. Right now, in many otherwise progressive gas companies, untrained boys are filing vouchers and invoices which represent the expenditure of thousands of dollars, and whose loss would be a serious matter.

Elsewhere in these articles we have dealt in detail with the importance of properly filing the papers used in the offices of the gas company. We have discussed executives' files and we have explained in detail the use of a pending file for active papers. But in no department do we feel that more expert care and guidance is needed in handling papers than in the auditing department.

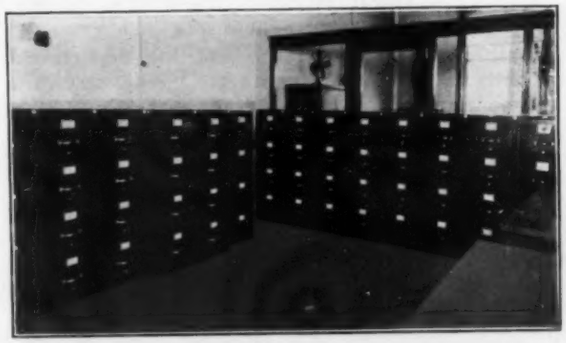
This is the tenth of a series of articles by Mr. Harris on Office Methods in Gas Companies. The next article will appear in an early issue.

Some Filing Fallacies

Before discussing the particular organization of the files of this important department, let us first point out the most general and most popular fallacies that we have found in gas companies throughout the country.

The first of these we have already touched on, namely, that the individual clerk can and should hold in his own desk the papers with which he works. No matter how strongly the clerk feels about this, we disagree with him emphatically. Papers accumulate. They are seldom kept in order. And even if the clerk does take time to keep them arranged, it is certain that he would be more valuable to the company if he spent that time in his regular work instead of in filing.

The second fallacy is the belief that filing is so simple that any one can do it, hence the office boy might just as well have something to do to keep him out of mischief. With all the schools of filing that there now are in the country, with filing executives receiving salaries equivalent to those of other executives, it would hardly seem necessary to argue at all against this practice. But it is still a practice, although fortunately it is becoming less and less general.



Another view of the same department. Every type of paper may be found in these files, from authorization for expenditure to vouchers

A third fallacy, and the most widely spread one of all, is the belief that no one central file can possibly be so organized as to care for all of the papers that are handled in the auditing department. Some of them must be filed alphabetically, some numerically, some chronologically. Some are of one size, some of another. Some accumulate rapidly, some slowly. Some must be kept for years, others only for weeks.

No wonder, then, that a centralized control of papers in the auditing department is almost unknown.

It is our purpose in this article to show that such a control not only is possible, but that it is most decidedly advisable.

Advantage of Centralization

When all of the files of the auditing department are brought together, we immediately effect several outstanding improvements. In the first place we centralize responsibility. If a paper is lost, we know who lost it and who is to find it. Of course, if we are to be able to place responsibility thus definitely no one must be allowed to "hold out." Every clerk must cooperate. Nothing is more demoralizing than for the file clerks to hunt and hunt and hunt for a paper, only to find that some one is holding it in his desk.

The second advantage is in having trained file clerks to handle the files. The auditing department of practically any gas company will give one clerk plenty of work to do, and most departments will require two or more clerks. In any event, there should always be a substitute clerk who can take over the files in the absence of the regular one. We have seen very expensive delays because too much dependence has been placed on one person. This, however, is only a sensible precaution, and no department head ever allows himself to be caught without relief for his regular clerks.

The third advantage is in economy of time, space and equipment. Instead of a number of half-filled filing cabinets around the department, every cabinet is used to capacity in a central location. Instead of a number of different indexes, one general index cares for all of the files. And instead of the wasteful use of special clerical help, the papers are handled wholesale by people who are trained to handle them both accurately and fast.

The Organization of the Files

Certainly the papers of the auditing department vary both in size and in character. And certainly, too, they require different methods of filing. But equally as certainly they can, with very few exceptions, be filed under one consecutively arranged master index, subdivided into subject divisions that are then divided into a numerical, dated, or any other required arrangement.

Moreover, it is seldom that the papers of the auditing department cannot be filed in a regular sized filing cabinet. We do not favor voucher or invoice cabinets, nor legal sized cabinets if they can possibly be avoided. Small papers, such as sales slips, can usually be filed in correspondence sized folders, and in many cases two rows of papers will be accommodated by one folder. This is much better than to try to have different sized cabinets for all of the different sized papers.

Certainly the use of the flat file and of cardboard box files which stand around on top of filing cabinets is to be discouraged. The vertical filing cabinet, correspondence size, has been almost universally adopted, and we strongly recommend its use whenever possible.

It would be impossible in this article for us to deal with each individual type of paper and show just how it should be filed, but we shall consider a number of typical auditing department papers, showing how these are cared for as units and then how they are combined into one general file.

Let us consider first the invoice and voucher file. After a voucher has been issued for an invoice, the two are usually fastened together, along with a copy of the purchase order and the receiving ticket. Such files are almost universally arranged alphabetically, even though the vouchers are numbered and are listed in the voucher register in this manner. Invoices, moreover, are usually held together, because the invoice file is in reality the accounts payable ledger.

The invoices cannot then be mixed in with the general correspondence. For example, we may have a number of letters from the General Electric Company, as well as contracts and other papers, but we would not file the General Electric invoices in the same folder with this general material. Instead we would provide, in the general file, a prominent guide labelled "INVOICES," and behind this guide we would place folders and subguides for the invoices of different companies. There may be individual folders for the larger companies, but it is wasteful and inadvisable to have a separate folder for each company from which an invoice has ever been received.

In short, under the main heading of "INVOICES," which would be one of the divisions of the main file coming under the letter "I," we may have a complete alphabetical file.

Clamps Not Recommended

Tax reports, and papers from which they are prepared, make up quite a volume of papers in the general auditing department. We have found it best to keep all supporting or "work" papers together with the master report, and to provide a separate folder for each report. We do not, however, advise fastening papers in a folder with a clamp, except in exceptional cases. This is an old railroad practice and can easily be carried to extremes. Only where there is a large number of important papers, which cover a long period of time and which are referred to more or less constantly, have we found it advisable to fasten them into the folders.

In the auditing department files, it can readily be seen that such papers as tax reports should not be held by individuals, and that they should be placed where there is a definite assignment of responsibility for their care. In the central file there should be a prominent guide in the index, "TAX REPORTS." Behind this there may be subguides such as "INCOME TAX REPORTS," "CITY TAX REPORTS," etc. The whole tax file of course is a division under the letter "T" in the main index.

Another prominent division of the auditing department files is payroll material. Time sheets, lists, final payroll authorizations, etc., make a voluminous file. They are filed by payroll date, and consequently the "PAYROLL" division of the general file will be subdivided by guides with date markings.

Work orders, or job orders, are always kept in numerical order. They are filed, therefore, under

the "W" division of the file, a certain number to a folder, and with a numerical index for each four or five folders.

In connection with the indexing of the file, we have found it best to have an index guide at regular intervals in the file. Such regularity adds to the ease of reference as well as to the appearance of the file. And long experience has shown that one guide to four or five folders is sufficient, provided the folders are comfortably filled.

We could go on indefinitely with illustrations of the handling of auditing department papers in a central file, but we feel that the idea is apparent from the discussion above. No matter how large the volume of papers applying to any one subject, they can logically be filed in their proper alphabetical position, and within the division which is set aside for them they can be indexed to suit the way in which they are referred to.

There are, of course, card records which cannot be brought together into such a centralized file. Punched cards, for example, which are very often used in stock accounting, must be kept near the machines in which they are used. Our discussion has included only such papers as make up the general routine of auditing department work as well as the general correspondence of the department. We have tried especially to show that the job order clerk should not be responsible for the job orders, that he should not be allowed to keep them in or on his desk. We have tried to show the advantages of centralization, both as to economy and efficiency.

And we would recommend that any auditing department, before discarding these suggestions as impractical, make a careful analysis of the handling of papers from day to day. See how much time is spent hunting for "lost" papers; see how many half-filled filing cabinets there are; see how many box files or piles of loose papers are kept on top of desks or filing cabinets; in short, see if much that has been said here doesn't apply to your department. If it does, it will pay you to try centralizing responsibility by having trained, capable, full-time employees care for this very vital problem.

Hello!

By Robert E. Livingston,

Director of Information, Consolidated Gas Company of New York.

ONE would never think of attempting to play Beethoven's ninth symphony on a harp of one string, and it would be equally ridiculous to try to handle many millions of telephone calls on a switchboard constructed on the lines of the "bicycle built for two" made famous by a song in years gone by. Therefore, in proportion to its business requirements of today and the demands that will come in the future, the Consolidated Gas Company of New York has today the largest private switchboard in the world.

The formal ceremonies that properly attended the transfer of the switchboard to the care and keeping of the Consolidated Gas Company of New York by the New York Telephone Company were recently held, and with one hundred and more prominent officials of the gas and electric branches of the Consolidated Gas Company's family surrounding them, Mr. George B. Cortelyou, president of the Consolidated, and Mr. James S. McCulloh, president of the New York Telephone Company, each picked up a hand desk set type of telephone receiver and transmitter and exchanged good natured greetings. In a few words, the large and complicated switchboard, containing 600,000,000 feet of wire of various sizes and lengths, was pronounced as the property of the Consolidated Gas Company and in operation.

It cost the New York Telephone Company about $200,000 to construct the switchboard, which is 125 feet long and built in the shape of a "U," so that the operators at each end of the board are back to back across a room thirty-four feet wide. The room is fifty-four feet long and on the auditorium floor in the new part of the Consolidated Gas Company's building.

There are now forty-one young women operators seated at the new switchboard every day with nine young women to act as substitutes or relief operators. More than 6,000,000 "calls" were handled over the old telephone switchboard in 1927, or something over 27,000 "calls" a day. The new switchboard is capable of accommodating seventy-five operators and handling 15,000,000 "calls" a year if necessary. The board has 60,000 "jacks," or those holes in which the operators place connecting plugs.

How "times have changed" and business has expanded is shown by contrasting the new switchboard with the Consolidated's telephone equipment in May, 1897. At that time one operator handled the telephone business for the company. Before that the company had two wall telephones, one for incoming and one for outgoing "calls." In 1911 the company had six telephone operators, and as recently as 1914 twelve girls could handle the telephone business, and until the new board was installed twenty-two operators competently transacted the wire messages between the company and its million and odd gas consumers.

Scene at world's largest private switchboard

The Future of By-Product Ammonia

By C. J. Ramsburg

Vice-President, The Koppers Company, Pittsburgh, Pa.

DURING the lifetime of most of those within the sound of my voice there have been three distinct periods of industrial development: Mechanical, Electrical and Chemical. I think that it is fair to say that we entered the period of significant chemical development during the World War and that since that time the influence of chemical engineering and chemical research has been greater than that of any other branch of technical knowledge. We are now in what might be called, popularly, a chemical age.

Since the human race is dependent for continuance on food, and food is dependent on agriculture, any development in the preparation of fertilizers for use in agriculture becomes of importance to every individual. In fact, there is probably no other subject of such unusual importance.

When the human race has its back against the wall fighting for existence and continuance, development is quickest and surest. For this reason the chemical development in the fixation of atmospheric nitrogen made rapid and enormous strides during the World War. For the same reason, the by-product coking industry made such remarkable progress during the same period particularly in America.

Results of Increasing Use of Nitrogen

During the meeting of the Institute of Politics in Williamstown, Mass., in 1926, it was my privilege to make an address upon the general subject of By-Product Ammonia. Now, after two years have elapsed, I have been asked to present the outlook for by-product ammonia as it appears today. The point which I am going to try to bring forward is that the increase in the consumption of nitrogen in agriculture and in industry is such that we can no longer depend on by-product ammonia to maintain the proportion of the market which it has been holding in the past ten years. The reason is not far to seek.

Curve 1 illustrates what has been going on in the coking industry in connection with the iron industry. Today there is three times as much sulphate of ammonia produced per ton of pig iron as was produced in 1913. In 1913, practically 73 per cent of the pig iron produced was made from beehive coke, with no ammonium sulphate production. In 1927 only about 10 per cent of the pig iron was produced from beehive coke. In 1925 there were in the United States and Canada approximately 11,700 by-product coke ovens. Table I is a summation of the ovens in operation prior to 1926, together with those built or contracted for up to January 1, 1929.

TABLE I

By-Product Coke Ovens—Built or Contracted For As of June, 1928

	No. of Ovens	Annual Coal Capacity Net Tons	Annual Ammonium Sulphate Production Net Tons
Prior to 1926	11,660	49,061,339*	633,649*
1926	617	5,198,150	57,200
1927	384	3,127,323	34,390
1928	905	8,824,560	97,100
Total Jan. 1, 1929	13,566	66,211,372	822,339

*Actual production for 1925.

From the present outlook there will be on January 1, 1929, 13,500 by-product coke ovens in operation, including the new Philadelphia Coke Company's plant, which will go into operation about that time. There will have been added to the 1925 capacity of 630,000 tons a potential production of by-product ammonium sulphate of approximately 190,000 tons per year, so that on that date the entire capacity of by-product coke ovens will amount to approximately 820,000 net tons of sulphate per year or 164,000 net tons of nitrogen.

As shown in Curve II, the by-product ammonia production of 1928 is estimated at four times that of 1913. In the six-year period, 1913-1919, the production doubled, and again will have doubled in the ten-year period, 1919-1928.

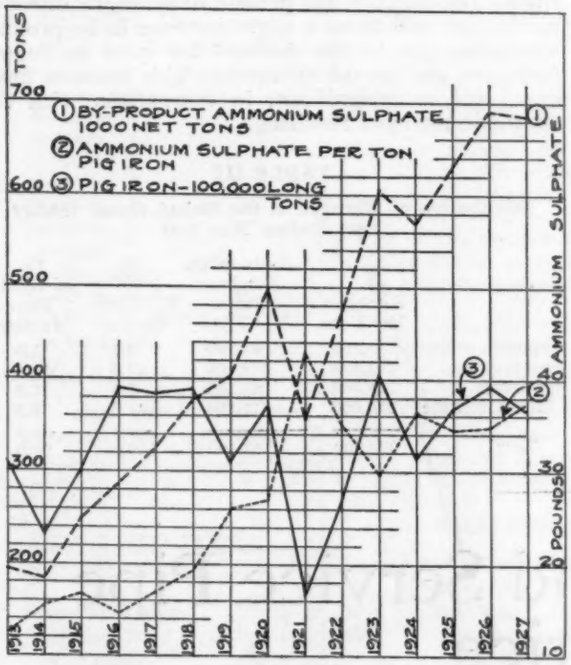
And now comes the important fact. This rapid rate of increase in by-product ammonia production, which has been witnessed during the past fifteen years, is not likely to continue.

Rapid Growth in By-Product Coke Production

By-product coke has replaced all but 15 per cent of the total coke produced in the United States, rising from 27.5 per cent in 1913 to 86.2 per cent in 1927. By 1929 this figure will probably be at least 90 per cent, but the 10 per cent of beehive coke remaining will decrease but slowly. The iron industry is now practically saturated, as regards coke production, and new ovens for this industry will be built only in proportion to the secular increase in iron

An address given June 14, at the Fourth Annual Convention of the National Fertilizer Association, Old Point Comfort, Va., June 11-14, 1928.

requirements. New by-product coke plants will be built for city gas and for domestic fuel supply, but such plants, even though many in number, cannot



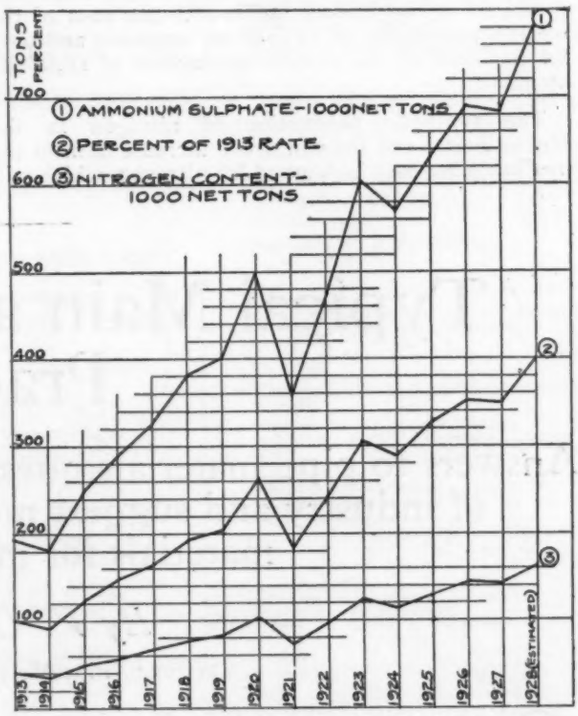
Curve I

be a large factor in increasing the production of by-product ammonia. At present, a large number of cities in the United States receive a substantial part of their gas from coke ovens. Among these are New York, Chicago, Boston, St. Louis, Detroit, Baltimore, Providence, Milwaukee, St. Paul, Cincinnati, Indianapolis, Buffalo, Fort Wayne, etc., with plants under construction to supply coke oven gas to Brooklyn, New Haven and Hartford. About 20 per cent of the gas distributed by manufactured gas companies comes from coke ovens.

The gas industry is a unit in the belief that in the future the base load gas for practically all locations will be coke oven gas or coal retort gas and for this reason there will probably be a large number of small and some large plants built in the future. But so far as ammonium sulphate from such plants is concerned, the production cannot be a great factor, compared to the amount already being produced. For example: A plant is now being built in Philadelphia which will produce approximately 35 per cent of the entire gas requirements of that city. The production of sulphate in this plant will amount to but 7,000 to 8,000 tons per annum. This is a large gas plant, but its output of ammonium sulphate will be less than 0.9 per cent of the estimated production of by-product sulphate for 1928.

My message to you is, therefore, that after January 1, 1929, the rate of increase in the output of by-product sulphate of ammonia will be relatively slow. Aside from comparatively small gas plant installations, new coke oven construction and consequently enhanced by-product ammonia production, will occur only as the iron industry expands.

This brings me to the thought which I had in the beginning of this paper, namely, that this is a chem-



Curve II

ical age. While by-product sulphate of ammonia with its rapid increase in production in the past ten years has been no small contributor to the happiness and well-being of a war-torn world, now chemical ingenuity must take up the burden of satisfying the increased demand for the most important product in the world—fixed nitrogen.

Already the chemist and the engineer, spurred by economic necessity, have developed methods for the

TABLE II
World Production of Nitrogen

Year ending May 31st,	1923-4 Net Tons	1923-4 Per Cent	1924-5 Net Tons	1924-5 Per Cent	1925-6 Net Tons	1925-6 Per Cent	1926-7 Net Tons	1926-7 Per Cent
By-product ammonia from coal—sulphate equivalent	1,682,000	29.8	1,738,200	28.2	1,837,000	25.8	1,830,000	27.7
Chilean nitrate—ammonium sulphate equivalent	2,157,800	32.0	1,960,000	31.8	2,129,000	29.9	1,064,000	16.1
All synthetic nitrogen—ammonium sulphate equivalent	1,807,000	38.2	2,465,500	40.0	3,155,000	44.3	3.714.000	56.2
Total nitrogen — ammonium sulphate equivalent	5,646,800	100.0	6,163,700	100.0	7,121,000	100.0	6,608,000	100.0
U. S. By-product ammonia from coal: Per cent of world production of nitrogen		10.7		9.2		8.9		10.4

fixation of atmospheric nitrogen, which have attained great commercial success. As shown in Table II synthetic ammonia is now a large factor of growing importance in the world's nitrogen production. In 1926-7, synthetic ammonia furnished 56 per cent of the world supply of nitrogen and, on an equivalent basis, was over five times the by-product ammonia production in the United States.

In the United States the picture is somewhat different. In the fertilizer year 1926-27, the distribution of nitrogen for the United States was as shown on Table III. By-product ammonia furnished 47.5 per cent of the total for the country and synthetic nitrogen only 6 per cent. In this period there was produced in the United States 37.6 per cent of the world's production of by-product ammonia and only 2.4 per cent of the world's production of synthetic ammonia.

The synthetic production of nitrogen in the United States and the world will increase to meet the inevitable increase in demand for nitrogen, which will occur at a rate beyond the power of the by-product coking industry to satisfy. By-product ammonia will continue to be produced in slowly increasing quantities. Incidentally, the growth of synthetic nitrogen production will cause a slight increase in by-product ammonia, due to the demand for coke to supply hydrogen gas for the synthesis. This amount, however, will be insignificant in comparison with the synthetic nitrogen resulting.

TABLE III

Distribution of Nitrogen in the United States 1926-27 Year Ending May 31st

	Nitrogen Net Tons	Ammonium Sulphate Basis Net Tons	% of U. S. Production	% of World Production
Imports	13,200	64,100	4.5	1.0
By-product	141,800	688,400	47.5	10.4
Synthetic	18,200	88,300	6.0	1.3
Chilean Nitrate	126,000	611,600	42.0	9.3
Total	299,200	1,452,400	100.0	22.0

Typical Main and Service Pipe Practice

Answers to pipe materials questionnaire indicate typical practice of industry and suggest most satisfactory methods and materials for mains and services

By V. C. Hoddick

Chairman, Pipe Materials Sub-Committee

QUESTIONNAIRES on "Pipe Materials" were sent to 76 member companies of the American Gas Association, and 41 answers were received from representatives of the companies. The information contained herein gives the detailed results of the answers. In an attempt to draw conclusions from the answers, "Composite Gas Services" have been devised. These represent the practices of a majority of companies answering the questionnaire. It is suggested that each member compare his service installation practices with that given as the composite service; such a comparison might prove valuable in correcting any difficulties which might be experienced with the type of service that you are now using.

There is also suggested a type of service installation which is slightly different from the composite service. This design, the writer considers, has merits which the composite service does not possess.

1. *What kind of connection do you make at C. I. mains for gas services?*

24—St. Tee, Plug, and St. Ell.
2—Saddle, St. Tee, Plug, and St. Ell.
1—Answered "Swing Joints."
4—No reply.
6—Use no C. I. Pipe.
1—St. Tee, Nipple and Cap, St. Ell.
1—Nipple, Tee, Plug, 45 deg. Ell.
1—Two St. Ells.
1—Swing Joint, 8-in. Nipple, Dresser Coupling.

2. *What Standards have you adopted in regard to size and kind of pipe used in running L. P. services?*

14—1¼-in. Black Steel.
9—1¼-in. Galvanized Steel.
8—1½-in. Black Steel.
1—1¼-in. Galvanized and Coated.
1—1¼-in. Copperoid.
1—1¼-in. Black Steel Coated.
1—1½-in. Black Steel, asphalted and wrapped.
1—1½-in. Black Steel, main to curb; 1¼-in. curb to cellar.
1—2-in. Black Steel.
4—No reply.

3. *What type of coupling do you use on low pressure services?*

17—Common Black.
13—Recessed Coupling.
2—Common Galvanized.
2—Recessed Galvanized.
1—McCluskey.
1—Dayton or Dresser.
5—No reply.

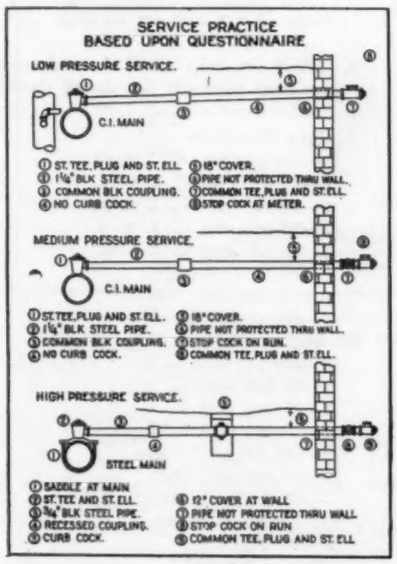
This paper is based upon a report by the author made to the A. G. A. distribution conference, Chicago, April 13, 1928.

4. *Do you install outside cocks or valves on all L.P. services?*

26—No.
11—Yes.
4—No reply.

5. *What is the minimum allowable cover on service at cellar wall entry?*

1—8-in. cover.
8—12-in. "
2—14-in. "
13—18-in. "
4—20-in. "
8—24-in. "
3—30-in. "
1—36-in. "
1—No cellars.
24—18-in. or less.
16—20-in. or more.
1—No cellars.


SERVICE PRACTICE
BASED UPON QUESTIONNAIRE
LOW PRESSURE SERVICE.
C.I. MAIN
① ST. TEE, PLUG AND ST. ELL.
② 1¼" BLK. STEEL PIPE.
③ COMMON BLK COUPLING.
④ NO CURB COCK.
⑤ 18" COVER.
⑥ PIPE NOT PROTECTED THRU WALL.
⑦ COMMON TEE, PLUG AND ST. ELL.
⑧ STOP COCK AT METER.
MEDIUM PRESSURE SERVICE.
C.I. MAIN
① ST. TEE, PLUG AND ST. ELL.
② 1¼" BLK. STEEL PIPE.
③ COMMON BLK COUPLING.
④ NO CURB COCK.
⑤ 18" COVER.
⑥ PIPE NOT PROTECTED THRU WALL.
⑦ STOP COCK ON RUN.
⑧ COMMON TEE, PLUG AND ST. ELL.
HIGH PRESSURE SERVICE.
STEEL MAIN
① SADDLE AT MAIN
② ST. TEE AND ST. ELL.
③ ¾" BLK. STEEL PIPE.
④ RECESSED COUPLING.
⑤ CURB COCK.
⑥ 12" COVER AT WALL.
⑦ PIPE NOT PROTECTED THRU WALL.
⑧ STOP COCK ON RUN
⑨ COMMON TEE, PLUG AND ST. ELL

6. *A considerable number of leaks has been found in the exposed pipe between the inside of cellar wall and riser. Have you experienced this difficulty, and if so, what steps have been taken to remedy it?*

8—No trouble.
7—Little trouble.
7—Cover or wrap pipe.
6—No experience.
3—Use all galvanized services.
2—Cover entire service.
2—Renew service through wall.
2—Use next large size as sleeve and fill space.
2—Use next large size as sleeve, welded at both ends.
1—Use galvanized through wall.
1—No reply.

7. *Fitting used inside cellar wall at service and riser.*

11—Common Tee, St. Ell and Plug.
2—Two St. Ells.
2—Common Tee and Plug.
1—One St. Ell.
1—Cellar Tee, Cap and St. Ell.
1—Uses *Curb* meters. Consumer runs service.
1—Common Tee, Plug, Close Nipple, Stop Cock, St. Ell.
3—No cellars.
19—No reply.

8. *Location of Stop Cock inside cellar, Low Pressure.*

16—Stop Cock at Meter.
9—Stop Cock at Riser.
*6—No Stop Cock—Low Pressure.
1—Stop Cock on run of Service.
1—Tee, Nipple, Stop Cock & St. Ell.
8—No reply.

* This undoubtedly means on Stop Cock on run or on riser. Stop Cock is probably placed at meter.

9. *Location of Stop Cock inside cellar, Medium Pressure.*

7—On run, as first fitting inside cellar.
6—On riser.
4—At meter.
13—No M.P. services.
11—No reply.

HIGH PRESSURE SERVICES

1-2. *What kind of connection do you make at Steel Mains for Gas Services?*

16—Use a Saddle.
2—Use Coupling welded to Main.
2—Use welded Tee.
1—Welds Plate on Main and Taps.
1—Uses Dresser Coupler Tee.
19—Have no H.P. Services.
12—Use St. Tee and St. Ell.
5—No information.
2—Welded Tee.
1—St. Ell, Nipple and Dresser Sleeve.
1—Expansion Bend.
1—Saddle or welded coupling.
19—Have no H.P. Services.

3. *What size and kind of pipe do you use for H.P. Services?*

9—¾-in. Black Steel.
2—¾-in. Galvanized Steel.
2—¾-in. Black Extra Heavy Steel.
1—¾-in. Black Steel Coated.
1—¾-in. Galvanized Extra Heavy.
2—1-in. Black Steel.
1—1¼-in. Black Steel.
1—1¼-in. Copperoid.
1—1¼-in. to curb; ¾-in. to cellar.
1—Not clear.
1—1-in. Steel or Wrought Iron.
19—Have no H.P. Services.

4. *Kind of Couplings used on H.P. Services.*

13—Use Recessed Couplings.
4—Use Common.
3—Weld Joints.
1—Uses Dresser Couplings.
1—Uses Galvanized.
19—Have no H.P. Services.

5. *Do you use outside Curb Cocks or Valves on H.P. Services?*

13—Yes.
9—No.
19—Have no H.P. Services.

6. *Minimum Cover on H.P. Services at entry to cellar wall.*

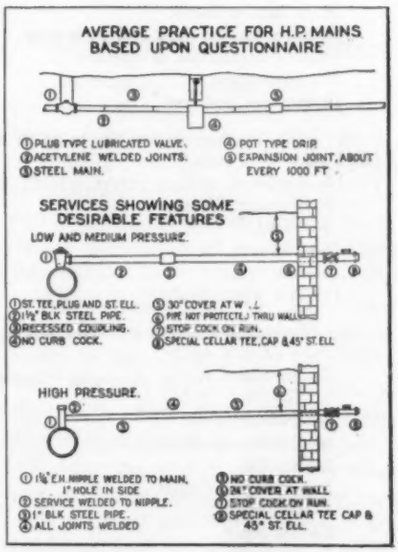
1—8-in. cover.
8—12-in. "
6—18-in. "
2—20-in. "
4—24-in. "
1—No cellars.
19—Have no H.P. Services.

7. *Is protection necessary through cellar wall on services?*

3—Wrap Pipe.
2—Use next larger size as sleeve, welded both ends.
1—Uses next larger size as sleeve.
16—Do not protect pipe.
19—Have no H.P. Services.

8. *Where do you place Stop Cock on H.P. Services?*

7—On run.
5—On riser.
5—Reply not clear.
5—No reply.
19—Have no H.P. Services.


AVERAGE PRACTICE FOR H.P. MAINS
BASED UPON QUESTIONNAIRE
① PLUG TYPE LUBRICATED VALVE.
② ACETYLENE WELDED JOINTS.
③ STEEL MAIN.
④ POT TYPE DRIP.
⑤ EXPANSION JOINT, ABOUT EVERY 1000 FT.
SERVICES SHOWING SOME DESIRABLE FEATURES
LOW AND MEDIUM PRESSURE.
① ST. TEE, PLUG AND ST. ELL.
② 1¼" BLK. STEEL PIPE.
③ RECESSED COUPLING.
④ NO CURB COCK.
⑤ 30" COVER AT W. ⊥
⑥ PIPE NOT PROTECTED THRU WALL.
⑦ STOP COCK ON RUN.
⑧ SPECIAL CELLAR TEE, CAP & 45° ST. ELL.
HIGH PRESSURE.
① 1½" E.H. NIPPLE WELDED TO MAIN, 1" HOLE IN SIDE.
② SERVICE WELDED TO NIPPLE.
③ 1" BLK. STEEL PIPE.
④ ALL JOINTS WELDED
⑤ NO CURB COCK.
⑥ 24" COVER AT WALL.
⑦ STOP COCK ON RUN.
⑧ SPECIAL CELLAR TEE CAP & 45° ST. ELL.

9. *What is your standard practice in regard to location of stop cock and fittings inside cellar wall?*

8—Common Tee, Plug & Ell.
1—Two St. Ells.
1—One St. Ell. & Stop Cock.
12—No reply.
19—Have no H.P. Services.

10. *If main is run in Parkway, do you use the same size service for the long side as you do the short side?*

32—Yes.
2—No.
3—No Mains in Parkway, except Duplicate.
3—Depending on estimated consumption.
1—No experience.

11. *On which of the following classes of services do you install outside cocks or valves that may be operated from the surface?*

Services in Business Districts—Yes, 13; no, 28.
Services in Stores, Apartments and Factories—Yes, 16; no, 25.
Services over 2-in.—Yes, 25; no, 16.

12. *What is your personal opinion of outside cocks or valves after being in use several years?*

17—Unsatisfactory.
15—Satisfactory.
3—O.K., but require maintenance.
1—Valves are satisfactory.
5—No reply.

Some of the comments are as follows:

About 1 in 10 can be used.
Usually leak after a few years.
Serve purpose for which they are installed.
Hard to locate and operate.
Satisfactory on 2-in. and larger.
Will work 50 per cent of time.
Necessary on large services.
Valuable—lubricated cock an improvement.
Frost heaves boxes.
Require maintenance and inspection.
Usually impossible to operate.
No advantage.
Investment justified.

13. *What method do you use to tie in a blind stub to a main?*

9—Locknut, or long screw.
9—Dresser Sleeve.
2—Weld.
1—Union.
9—No reply.
11—No blind Stubs.

14. *If necessary to use a service sleeve, what type do you use?*

18—Standard A. G. A. Split Sleeve, Tapped.
5—Dresser Type.
4—Saddle or Sleeve.
3—Saddle.
1—Threaded Outlet.
1—Hammond.
2—No reply.
7—Do not use.

15. *Do you consider type of sleeve that you use satisfactory?*

30—Find sleeve satisfactory.
1—A. G. A. little light.
1—A. G. A. little heavy.
9—No reply.

16. *What materials do you use in making up the flange joints and pipe joints on service sleeves?*

Flange Joints—

5—Lead.
5—Asbestos.
4—Mill-board.
2—Fibre.
1—Tar Paper.
1—Kersarge Cloth.
1—Paper.
22—No reply.

Pipe Joints—

5—Cement.
4—Lead or Cement.
2—Lead.
1—Rubber Ring.
29—No reply.

17. *In districts where house heating is a probability, do you install services large enough to take care of this house heating load?*

21—No.
11—Yes.
4—Standard Service satisfactory.
2—Run independent service for House Heating.
3—No reply.

1. *What make of C. I. Pipe do you use?*

22 companies use sand cast exclusively.
4 companies use sand cast and sand spun.
3 companies use sand cast and De Lavaud.
3 companies use sand cast and horizontal cast (McWane).
1 company uses De Lavaud and horizontal cast.
1 company uses sand cast, horizontal cast, and is trying out sand spun.
1 company uses sand cast and very little sand spun and horizontal.
6 companies have no cast iron pipe.

2. *What lengths do you use—12 ft. or 16 ft.?*

18 use 12 ft. lengths for all sizes.
3 use 16 ft. lengths for 12 in. and smaller sizes.
3 use 16 ft. lengths for 10 in. and smaller sizes.
2 use 16 ft. lengths for 6 in. and smaller sizes.
2 use 12 ft. lengths, but have tried 16 ft. in 10 in. and 12 in.
1 uses 12 ft. lengths, and is trying out 16 ft.
1 uses 12 ft. lengths, 13 ft. 1½ in. lengths, and 16 ft. 5 in. lengths.
2 use 12 ft. and 16 ft. lengths, but did not specify pipe sizes.
2 use 16 ft. in all sizes.
7 use no C. I. Pipe.

3. *What are the relative merits of 16 ft. lengths as compared with 12 ft. lengths?*

16—Favor 16 ft. lengths because of fewer joints and bell holes.
7—No experience with 16 ft. lengths?
3—16 ft. lengths O.K. for 4 in. and 6 in.
1—Does not want to mix sizes.
3—12 ft. best for all purposes.
4—No comment.
7—No C. I. laid.

Some of the opinions are quoted below:

16 ft.—Handling costs less, cheaper to lay and less leakage.
16 ft.—Waste in cutting. Inconvenient in congested districts.
16 ft.—Fewer joints and bell holes.
16 ft.—Lower installation cost.
12 ft.—Better in congested districts; less liable to break.
16 ft.—Expense of handling in larger sizes overcomes any possible saving in fewer joints and bell holes.

4. *What type of bell do you use?*

17 use No. 1 Bell for all sizes.
4 use No. 1 Bell for 6 in. and under. Larger sizes No. 2 Bell.
5 use No. 1 Bell for 8 in. and under. Larger sizes No. 2 Bell.
2 use No. 1 Bell for 12 in. and under. Larger sizes No. 2 Bell.
1 uses No. 1 Bell for 16 in. and under. Larger sizes No. 2 Bell.
1 uses No. 1 Bell for 8 in. and under. Larger sizes Dresser Coup.
1 uses 5 in. Bell with lead ring.
1 uses No. 1 Bell but with 3/8 in. joint space.
1 No reply.
7 use no C. I. Pipe.
1 uses No. 2 Bell for all sizes.

5. *What per cent. of C. I., and what per cent Steel pipe did you install during year 1927?*

A—Low Pressure:

20—100 per cent C. I. used.
4—95 per cent C. I. used.
2—90 per cent C. I. used.
2—70 per cent C. I. used.
2—50 per cent C. I. used.
2—No low pressure.
6—100 per cent Steel.
3—90 per cent Steel.

B—Medium Pressure:

14—100 per cent C. I.
1—99 per cent C. I.
1—95 per cent C. I.
1—75 per cent C. I.
9—100 per cent Steel.
1—75 per cent Steel.
1—70 per cent Steel.
12—No M. P. mains.
1—No reply.

C—High Pressure:

24—100 per cent Steel.
1—95 per cent Steel.
1—75 per cent Steel.
1—50 per cent Steel.
12—No. H. P.
2—No reply.

6. *Do you install Steel, or Wrought Iron Pipe?*

31—Steel.
1—W. I.
1—Steel or W. I., depending on soil.
6—Neither.
2—No reply.

7. *Assuming that steel pipe has the same life as C. I., would you prefer it?*

29—Yes.
5—No.
6—No reply.
1—Not necessarily.

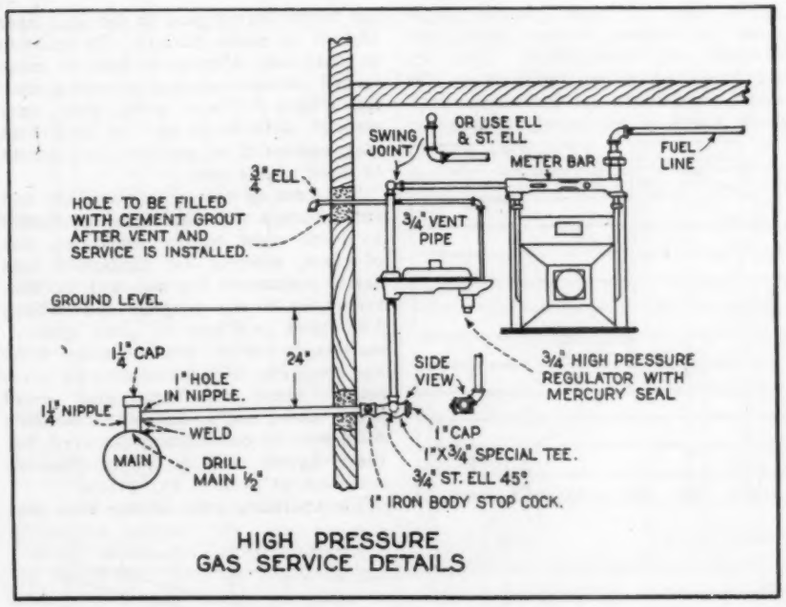
8. *Do you consider it desirable to install steel mains in congested districts and on streets having heavy traffic?*

13—Steel mains better.
11—C. I. mains better.

7—Depends on electrolysis, or soil conditions.
1—No, except H. P.
1—Assuming same life, yes.
1—Steel safer; C. I. longer life.
7—No reply.

11. *If you supply any community or district with dehydrated gas, at what depth are the mains and services laid in that district?*

30—No dehydrated gas.
2—Naturual gas.
1—4 in. every 1,500 ft.; 6 in. every 1,200 ft.; 8 in. every 900 ft.; 10 in. every 800 ft.; 12 in. every 600 ft.
1—At valves, every 1,000 ft.
11—No reply.



HIGH PRESSURE GAS SERVICE DETAILS

9. *What type of joints do you use on Steel pipe?*

11—All gas welded.
1—Gas or Electric welded.
4—Small size couplings; larger sizes acetylene welded.
3—All screw couplings (only runs 2 in. steel mains).
2—Weld up to 12 in., larger sizes Dresser Couplings.
3—Screw couplings on smaller sizes. Dresser on larger.
4—All types, depending on pressure and size.
1—Dresser coupling on all sizes.
9—No steel pipe.
1—Acetylene weld 12 in. and over; smaller sizes, Dresser Couplings.
1—Acetylene weld or Dresser Couplings.
1—Screw or Dresser Couplings.

10. *If you weld pipe, have you experienced any difficulty with breaking of joints on pipe sizes above 6 in.?*

15—No trouble.
4—Slight trouble.
5—Have had trouble.
1—Reports difficulty on 12 in. line; electric welded.
1—Anneals welds on large sizes to avoid trouble.
1—Tests joints thoroughly by dropping.
4—No welded pipe.
9—No experience.
1—No reply.

1—42 in. cover.
2—36 in. cover.
2—30 in. cover.
2—24 in. cover.
1—18 in. cover or less.
1—12 in. minimum.

12. *What type of drips do you install on your high pressure lines?*

11—Pot type.
2—Pot type with baffle.
1—Pot type with baffle for first 5 miles, then blow-offs.
1—Reservoir type.
2—Full opening, reservoir type.
2—Blow-off from bottom.
2—No drips on H. P.
1—Natural gas, no drips.
1—Fullerton Nozzle type.
5—No reply.
13—No H. P. system.

13. *Do you consider it necessary to install expansion joints on high pressure welded lines? If so, how far apart?*

10—Expansion joints not necessary.
3—Expansion joints about every 500 ft.
4—Expansion joints about every 1,000 ft.
4—Expansion joints at valves.
1—Expansion joints every three lengths.
1—Expansion joints at tuurns.
2—Expansion joints necessary.
3—Expansion joints necessary on mains over 12 in.

14. *What are the relative merits of gate valves and plug cocks?*

25—Favor lubricated plug cock.
4—Favor gate valve (2 are L. P. companies).
3—Non-committal.
9—No experience with plug type valve or cock.

Comments:

Lubricated plug type very expensive.
Lubricated plug type has positive shut-off.
Gate valves leak, due to dirt and accumulation on the seats.
Lubricated Plug type hard to operate in large sizes.
Capacity of gate valves greater.
Lubricated type must be kept lubricated by routine inspection.

WISE INDUSTRIAL EXPANSION

A warning to ambitious cities that industrial expansion is beset with economic pitfalls was sounded by E. W. McCullough, manager of the Department of Manufacture of the Chamber of Commerce of the United States, at the Washington conference of industrial bureau managers.

"Any community," he said, "that either develops the building of industrial plants or induces plants to locate with them and does not give consideration to the factors which will tend to insure success is simply inviting a calamity which will have the double effect of placing loss not only upon the industry, but upon the local people who invest or are interested in it.

"Production in many lines of industry has reached its peak, at least until larger markets and better distribution are established. Consequently to build more plants and expand capacity to produce in those lines is little short of folly.

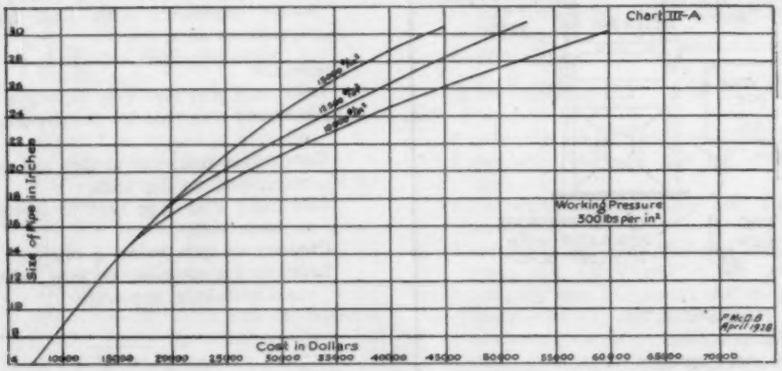
"The relocation of plants today, or the establishment of new ones by successful corporations, is done wholly for economic reasons, and to secure these plants you have advantages, perhaps in transportation, material supply, labor or proximity to a profitable market. The last is more important than all the others combined. There is no great exodus of plants moving from one location to another, but there is a normal movement for economic reasons."

Limiting Factors for Natural Gas Projects

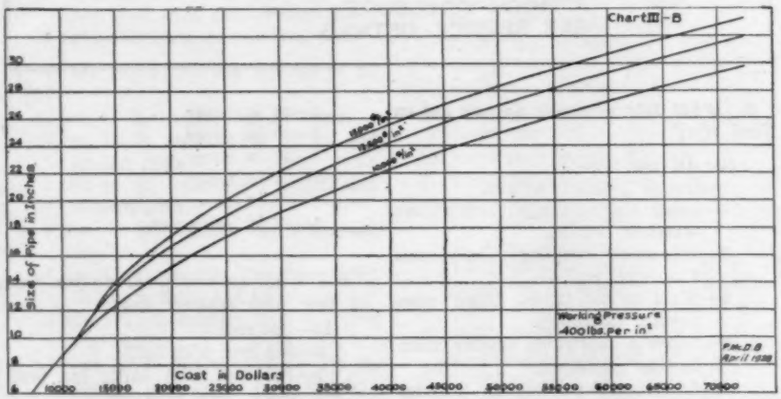
By P. McDonald Biddison

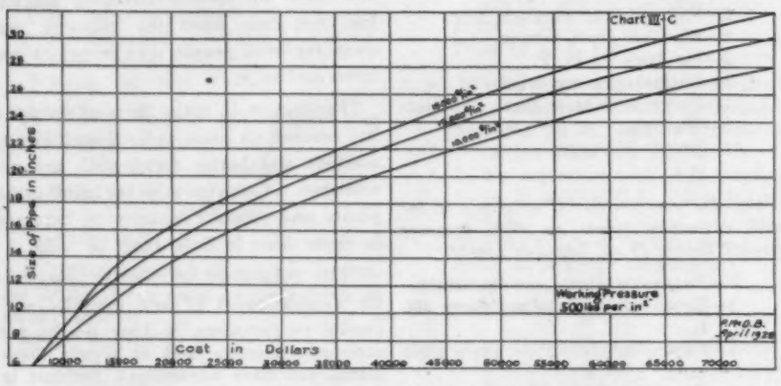
(Continued from page 64, May, 1928)

THE cost per mile of pipe lines may be taken from charts III-A, B or C, which show what may be called relative average costs for three different pressure conditions at three different stresses in pipe walls.



The curves for 10,000 lbs. tensile stress correspond to the highest stress allowable in past practice with usual lap welded steel pipe. The curves for 12,500 lbs. and 15,000 lbs. stresses represent what may be hoped for in the future if pipe mills are able to successfully lap weld skelp of higher carbon ratios than present practice* or if electrically welded pipe of corresponding tensile strengths come into general use as now appears possible. The use of such higher strength steels for pipe manufacture would for markets requiring line sizes about 12-inch enable natural gas service to be given to communities now entirely beyond reach.





The costs as given include allowances for overhead, interest during construction and contingencies. They are not based on either the best or the worst conditions; for territory excessively rough or excessively swampy or for bad rock conditions, additions must be made. Allowances have been made for pipe protection in such an amount as to cover most any type that experience, hope, prejudice or gullibility may indicate to be proper for the particular conditions. Pipe is taken at $90 per ton delivered plus $1 per inch over 18-inch or under 12-inch. In addition to these costs allowances must be made for all stream crossings requiring multiple lines. These costs may vary through wide limits and on long lines may amount to as much as 10 per cent or more of line cost.

The cost of compressor stations will vary through wide limits, being affected by local water supply conditions, size of plant, whether for temporary field use or permanent line use; and the idiosyncrasies of the designer and builder. The curve on Chart IV gives approximate costs for line stations under average conditions with allowances for overhead. Some conditions may entail higher costs, and under some conditions costs may be considerably bettered, but these figures will do for preliminary estimates at present day prices.

The operating costs of pipe lines may be taken from Chart V-A, B or C, and of compressor stations from Chart VI, both of which include labor and supplies, interest, return, amortization and taxes. The total operating costs on a system will then be the sum of the line and station operating expense plus a sum for management which may vary widely, depending upon the scheme of management. It will seldom be less, however, than 75c. per M.C.F., and on small projects may exceed 1c. per M.C.F. of sales.

From the above data a quick estimate may be made of the transportation costs on any particular project. To these costs must then be added the cost of gas at the field and the possible prices at which gas may be delivered at the terminals of a system are obtained. It need not be inferred that all projects which fail by test from the above data are not possible, but those which do not pass

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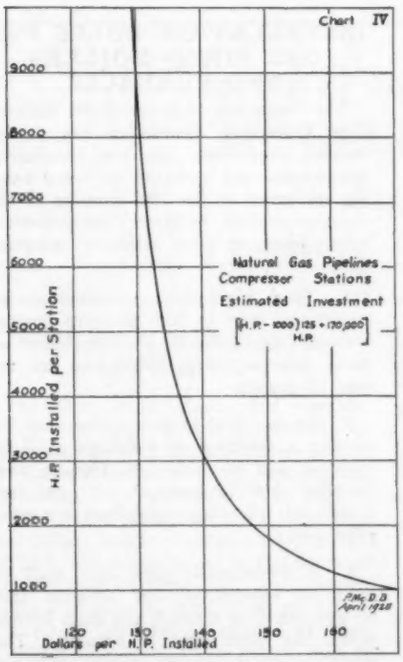
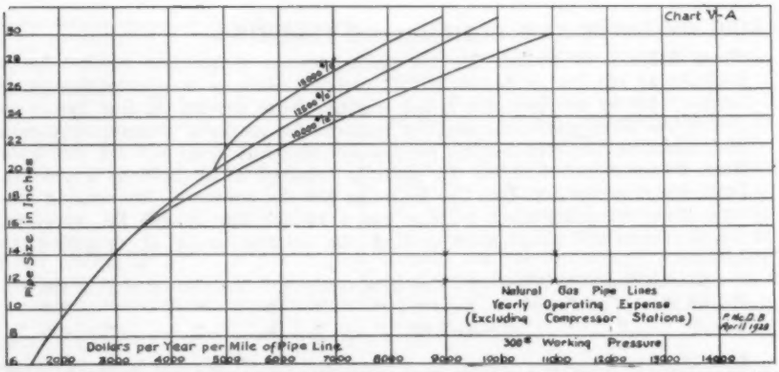
*See "Improving Line Pipe," Frank N. Speller, Oil and Gas Journal, June 16, 1927.

Read at Natural Gas Meeting, Dallas, Texas, May 7-10, 1928.





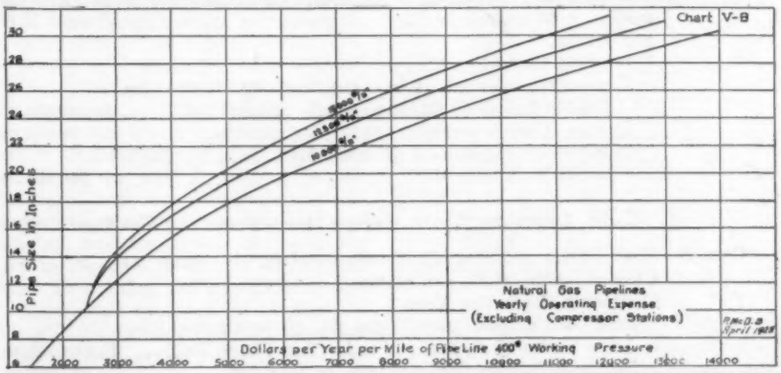
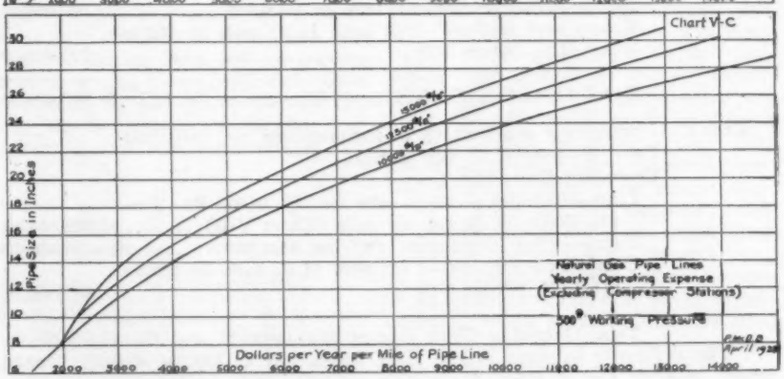
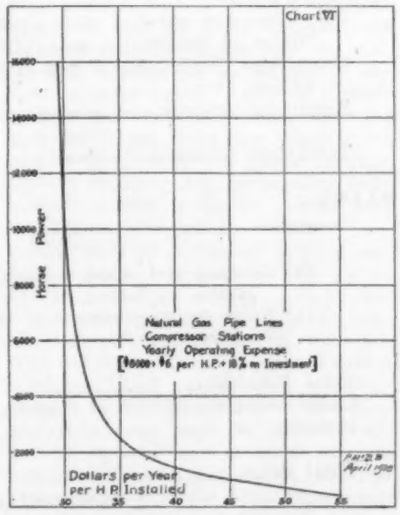


Chart V-B
Natural Gas Pipelines
Yearly Operating Expense
(Excluding Compressor Stations)
Pipe Size in Inches
Dollars per Year per Mile of Pipe Line 400# Working Pressure
P.McD.B. April 1928



will need careful scrutiny and detailed estimating before they can be pronounced sound. In addition, after having found the price of delivered gas, due consideration must be given to whether there is enough spread between such delivered price and the retail prices obtainable for the distributing company to eke out an existence. Few, if any, distribution systems can exist on less than the equivalent of $7.50 per year per customer plus 25c. M.C.F. distribution charge on domestic gas and 2c. per M.C.F. distribution charge on manufactured gas. If the distributor has a manufacturing plant investment to wipe out he may need $6 to $8 per year per meter in addition to the above to prevent loss of the investment in the manufacturing plant.

As an example of the use of the data given herein, assume a city 300 miles from the gas supply with minimum temperature of 25 degrees and 1,000 degree days deficiency per year below 65 degrees F., a population ultimately to be provided for of 300,000, and a volume of industrial business apparently ultimately obtainable of 7,000,000 M.C.F. per year. The calculations follow:



PEAK LOADS—

Domestic $\frac{300{,}000}{6}$ = 50,000 Consumers.

(a) Cooking and water heating per meter per day.

$$\frac{25{,}000 \times 1.1}{365} = 75 \text{ C.F.}$$

(b) Space heating per meter per day.

(65—25) 16 ..... 480 C.F.

Total Domestic Peak—50,000 meters at 555 C.F.... 27,750,000 C.F. per day

Industrial $\frac{7{,}000{,}000}{365 \times .70}$ = ... 27,400,000 " " "

Unaccounted for—(See sales below) $\frac{307{,}500{,}000}{365}$ = 843,000 " " "

Total Peak Load Per Day ..... 55,998,000 " " "

SIZE OF LINES AND COMPRESSOR STATIONS—

From Table I an 18-inch line 150 miles between compressor stations has a capacity at 400 lbs. of 54,750 M.C.F. per day. It may be selected for a preliminary set up and pressure raised slightly above 400 lbs. in final design to secure the small additional capacity required for markets, compressor station fuel, and line loss. If stations be spaced 100 miles apart we are still confined to an 18-inch line for the capacity required if we hold to a 400 lbs. limit, but may use a 16-inch line by using 500 lbs. pressure. By spacing stations about 75 miles apart we can use a 16-inch line at 400 lbs. pressure. To determine the selection let us find the relative costs of operating as follows:

A—18-inch line, 300 miles—2—150-mile sections, 2 compressor station 400 lbs.
B—16 " " " " —3—100 " " 3 " " 500 "
C—16 " " " " —4— 75 " " 4 " " 400 "

Case A—Horsepower required @ 3 compressions (Chart II) is 64 H.P. per million x 56 million or 3584. Allowing for spares, install 4000 H.P. per station.

Operating Costs Per Year—

Line—300 miles of 18-in.—400 lbs. @ 10,000 lbs. Tensile Stress @ $5,010 per mile (Chart V-B)	$1,503,000.00
Extras—(See investment) 18% on $500,000	90,000.00
Compressor stations—2 @ 4000 H.P. each @ $32.50 per H.P. (Chart VI)	260,000.00
Total Operating Costs Except Management and Gas	$1,853,000.00

Case B—Horsepower required @ 3 compressions is same as Case A—4000 H.P. per station.

Operating Costs Per Year—

Line—300 miles of 16-in.—500 lbs. @ 10,000 lbs. Tensile Stress @ $4,950 per mile (See Chart V-C)	$1,485,000.00
Extras—(See investment) 18% on $500,000	90,000.00
Compressor stations—3 @ 4000 H.P. each @ $32.50 per H.P. (Chart VI)	390,000.00
Total Operating Costs Except Management and Gas	$1,965,000.00

Case C—Horsepower required @ 3 compressions is same as Case A—4000 H.P. per station.

Operating Costs Per Year—

Line—300 miles of 16-in.—400 lbs. @ 10,000 lbs. Tensile Stress @ $4,210 per mile (Chart V-B)	$1,263,000.00
Extras—(See investment) 18% on $500,000	90,000.00
Compressor stations—4 @ 4000 H.P. each @ $32.50 per H.P. (Chart VI)	520,000.00
Total Operating Costs Except Management and Gas	$1,873,000.00

The difference between A and C is small, but C has a slightly larger actual capacity and is selected for that reason.

INVESTMENT—

Pipe Line—300 miles of 16-in.—400 lbs. @ 10,000 lbs. Tensile Stress @ $25,500 per mile (Chart III-C)	$7,650,000.00
Compressor Stations—4 @ 4000 H.P. @ $136.50 per H.P. (Chart IV)	2,184,000.00
Extras for streams and unusual conditions	500,000.00
Total Cost, Including Overhead	$10,334,000.00

SALES—

Domestic:

	M.C.F.
(a) Cooking and water heating, 25M.C.F. x 50,000 Consumers	1,250,000
(b) Space heating, 1,000 deg. days x 16 ft. x 50,000 Consumers	800,000
Total Domestic	2,050,000
Unaccounted for @ 15% of Domestic	307,500
Industrial	7,000,000
Total Sales	9,357,500

(Continued on page 62)

INSTALLATION RULES FOR GAS FIRED BOILERS AND FURNACES

The Committee on Gases of the National Fire Protection Association has recommended regulations for the installation, maintenance and operation of house heating equipment at the 1928 meeting of the Association held in May. The important rules proposed for tentative adoption were:

1. These regulations are intended for application only to low pressure heating systems. Such systems shall be defined as those wherein the pressure does not exceed 15 pounds.

2. No gas fired boilers or furnaces for heating a building or buildings shall be installed and no boiler or furnace now installed shall be supplied with gas fuel unless the following regulations are complied with:

3. A thermostatic pilot light shall be used, so constructed and adjusted that no gas can flow through the main burner unless the pilot light is burning. The operation of the safety device shall not depend on the closing of an electric circuit to shut off the main gas supply.

4. The boiler or furnace shall be equipped with safety devices arranged to shut off the main burners in case of high steam pressure or low water (or high temperature) for steam or vacuum vapor boilers, or high air temperatures for warm air furnaces. A steam or vacuum vapor boiler equipped with a high temperature limiting device need not be equipped with high pressure or low water cut-off. These devices shall not depend upon the closing of an electric circuit to shut off the main gas supply. This section shall not be understood to prohibit the use of electrical regulating devices provided safety devices meeting the above requirements are also installed.

5. An approved gas pressure regulator of sufficient size shall be installed in the gas line leading to the appliance.

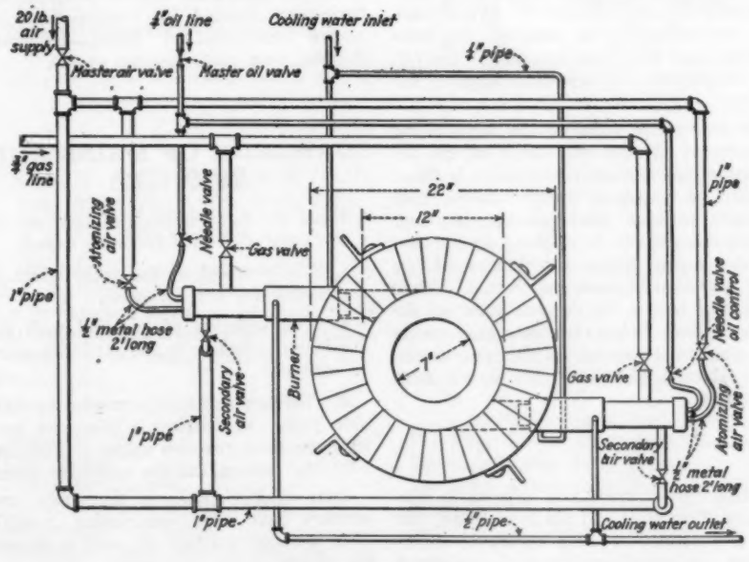
6. All boilers or furnaces shall be connected to flues. The size of the flue and flue pipe shall be proportionate to the maximum rate of gas consumption, not less than 10 square inches in cross sectional area for each 50,000 B.t.u. of gas used per hour. All flue pipes shall be provided with a draft break or down draft diverter of an approved type which shall have a cross sectional area at least equal to that of the flue pipe. No gas valve shall be installed in the flue pipe unless so arranged that the main gas valve will not open until the damper has opened, and the damper will not close until the main gas valve has closed, in which case the damper and draft break shall be so located and proportioned that they will not cause the formation of carbon monoxide even if the damper is closed while the gas is burning.

Technical and General MISCELLANY for The Busy Gas Man

MUFFLE TYPE POT FURNACE

The illustration shows this furnace, which is maintained at a temperature of 1,650 degrees C. The apparatus consists of the furnace proper, the burners and the hollow core or muffle. The furnace proper was a sheet iron shell lined with the highest grade of firebrick. The use of high aluminous brick in the place of firebrick has been suggested. The firebrick lining proved to be good after more than 200 hours operation in periods of three to eight hours each. The hollow core or muffle was made from Carbofax cement No. 3 in a split mold made of six-inch pipe. Alundum cement of the consistency of thick cream was employed in painting the inside and out of the air-dried muffle.

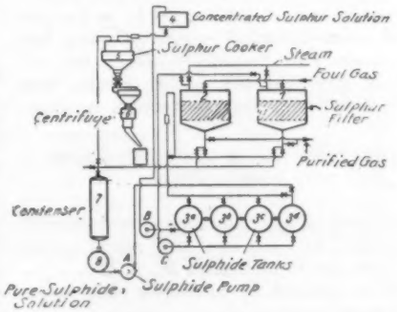
The water-cooled combination gas or oil burners were constructed from pipe fittings. Each burner consisted of a water-cooled shell to which connections were welded for gas and secondary air, and an atomizing head with oil and air connections so arranged that the head could be moved forward or backward in relation to the inner ends of the burner shell. The best operation of the burners was obtained with the atomizing head about four inches back from the inner end of the burner shell. The common method of employing a small stream of air at right angles to a jet of oil was used to atomize the oil. This air-oil mist was surrounded by six streams of secondary air so that the proportionate amounts of oil mist and air could be regulated to give a short clean flame. In starting the apparatus or for low temperature operation the burners are operated with city gas. In such cases the atomizing heads are pulled back as far as possible. This is also true when the burners are to be shut off for more than a few minutes so that the head will not become heated to a temperature sufficiently high to carbonize the oil. E. P. Barrett and C. E. Wood, Chemical and Metallurgical Engineering, year 1928, pages 179-180.



USING ACTIVATED CARBON IN THE GAS INDUSTRY

The causes of the activity of the carbon are discussed as well as the methods used in the manufacture of this product. The most important properties and characteristics of activated charcoal from the standpoint of its use in the gas industry are examined. Two analytical methods for the determination of benzol in coal gas are also described. Considerable detail is given on the practice of recovering benzol from coal gas by this process, and the various processes which have been recommended for this purpose were examined from the technical and economic standpoint.

An example of the catalytic action of activated charcoal or carbon is cited in the oxidation of sulphuretted hydrogen to sulphur. The operation of this process which has for its purpose the purification of both coal gas and coke oven gas by the removal of its sulphuretted hydrogen content and the recovery of pure sulphur is described. An installation of rather large size in which this process is used is also described.



The principle on which the desulphurizing process is carried out is shown in diagrammatic form in the accompanying figure. The coke oven gas or coal gas, freed from the tar and ammonia content, containing three to four per cent by volume of air, is mixed with approximately 0.3 gram per cubic meter or 0.3 ounce per 1,000 cubic feet of ammonia gas. The gas is then passed through the active charcoal, which is located in the sulphur filter 1, and it leaves this filter completely freed of its sulphuretted hydrogen content. Just as soon as the purified gas shows a trace of sulphuretted hydrogen—which happens at all times after the filter has been operated a definite period of time—the flow of gas is directed through the second sulphur filter 2 and the activated carbon in filter 1 is revivified in the meantime.

The pump C draws the ammonium sulphide solution, from 12 to 15 per cent concentration, from the sulphide tank 3a, and pumps it into the sulphur filter 1, until the activated carbon is thoroughly wet down with the liquid. After the sulphide solution has been in contact with the activated carbon for a short time, it begins to dissolve out the sulphur precipitated in the latter, and the resulting polysulphide solution is allowed to flow back into the sulphide tank 3a.

This operation is repeated with the carbon disulphide contained in tanks 3b, 3c, and 3d, so that the solution from the last tank in the series comes in contact with activated carbon which is free from sulphur and hence a small amount of carbon disulphide, itself containing no sulphur, remains behind in the carbon. This solution is removed from the activated carbon by steaming with saturated steam at approximately 212 degrees F., and the waste steam from the filter—mixed with ammonia and sulphuretted hydrogen gases

—is condensed in the open condenser 7. The run-off from the condenser flows into the pure sulphide tank 8 and the pump A pumps this liquor from tank 8 into tank 3d. The revivification of the carbon is thereby completed.

After the process has been worked for some time, the sulphur-saturated polysulphide eventually fills tank 3a. This liquor contains 440 to 1,320 pounds of sulphur in 220 gallons of liquor. This solution is then worked up into sulphur. For further details see the article by Dr. A. Englehardt in Das Gas und Wasserfach, year 1928, pages 290 to 295.

CONDENSATION OF GAS

Coal gas usually leaves the retorts at a temperature of 450 degrees F. in the case of steamed vertical retorts. Coming into contact with the cool walls of the offtake pipes the gas quickly attains, with the higher boiling constituents, a super-saturated condition, and very small globules of tar are thus formed which partly condense, and flow away to the siphons and storage well. By the time the gas enters the condensers it has fallen in temperature to approximately 160 degrees F., or in the case of horizontal retorts about 30 degrees F. lower.

In designing the equipment of plants operating steamed vertical retorts, the existing condensing apparatus had to be increased. Thus a much larger cooling surface is given to the offtake pipe of the horizontal than to that of the vertical retort for the same gas yield. What is more important, some of the steam used in steaming the vertical passes through the retort unchanged, and its latent heat prevents the temperature falling to the same extent. In both these cases the gas is nearly saturated with water vapor when it enters the condensers, and the amount of heat required to be removed from steamed vertical gas at 160 degrees F. is more than double that from horizontal retort gas at 130 degrees F. This difference is due almost wholly to the latent heat made sensible by the water vapor in turning to a liquid, as is shown in the following calculation.

1,000 cubic feet of gas at 60 degrees F. will carry when saturated.....	at 160 deg. F. 2.2 gals. of water as vapor	at 130 deg. F. 0.82 gallon of water as vapor
Amount of water as vapor at 60 degrees F.	0.08 gallon	0.08 gallon
Amount of water condensed out in cooling this gas to 60 degrees F.....	2.12 gallons	0.74 gallon
B.t.u removed in condensing this water vapor	21.2 x 976 = 20700	7.4 x 976 = 7200
Sensible heat removed in cooling the gas to 60 degrees F., B.t.u.....	2000	1400
B.t.u. in condensing the tar.....	350	300
Total heat to be removed in cooling the gas to 60 degrees F., B.t.u.....	23050	8900

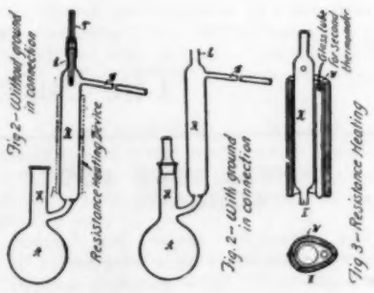
This means that gas saturated with water vapor at a temperature of 160 degrees F. requires about two and a half times as much heat to be removed as at a temperature of 130 degrees F. Were there no condensates to be removed, the ratio would have been in proportion to the fall in temperature in each case, namely, 100 to 70.

A method of reducing the naphthalene content of the gas and hence of the deposits of naphthalene in the mains is shock cooling of the gas at the condensers. This appears to give good results, although there also appears to be some danger that some of the lighter constituents of the gas may also be removed from it. While this may reduce the thermal value of the gas, it nevertheless improves the quality of the tar recovered in the gas works. Gas Journal (London), March 21, 1928, page 747.

FRACTIONATING LIQUIDS IN THE LABORATORY

The investigation of products, such as coal tar oils and the like, requires the use of a fractionating apparatus which, while not being too complicated, still should enable careful fractionation of the liquid. The operation should be capable of being carried out both under reduced pressure and at ordinary pressure in the apparatus and the joints should be of such a nature that materials, which would affect the analytical results, need not be used in rendering them tight. It has been found that as a general rule such apparatus is entirely too complicated even for research work, not to say routine analyses.

The apparatus which is shown in the accompanying illustration has been found to be admirably suited for this work. A round bottom flask, provided with a side tube (for example, a distilling flask), is connected, as shown, with a column. A thermometer is inserted at the top through a constricted neck and the bulb of the thermometer is just opposite to the outlet tube d. The thermometer fills out the hole in the rubber tubing to such a degree that the distilled vapors do not come into contact with the rubber at all. There



is also but little space above the outlet tube in the column, for such space always has a detrimental effect on the fractionation. When the round bottom flask is provided with a neck with a ground-in-portion, the flask may be connected with a vacuum pump and the fractionation may then be carried out under reduced pressure. The column is itself filled with glass Raschig rings. In order to be able to use the column with high boiling mixtures, an electrical heating device is used to heat the column up to a temperature within 50 to 100 dregees C. below the expected boiling point. The character of the heating device is shown in the accompanying illustration. The size of the flask is important in procuring the correct results from this apparatus, and various sizes of flasks are provided for fractionating different quantities of liquid.—Chemiker Zeitung, year 1928, page 389 to 390.

CORROSION OF MAINS AND SERVICES

There are three methods of approach to a particular corrosion problem, namely:

1. The removal of the agent which is responsible for the corrosion.

2. The selection of material with the maximum resistance to the particular agent of corrosion.

3. The prevention of corrosion by suitable protective coatings. Wherever possible the most effective means is undoubtedly the removal of the corrosive agent.

Iron oxide deposits in the mains and services have been occasioning trouble. The average analysis of such a deposit are shown on the next page.

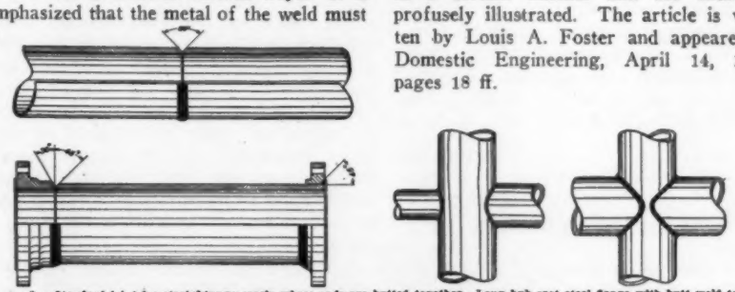
The pipe used should be as resistant as possible to the agents of corrosion. A committee appointed to consider the matter of pipe decided that wrought iron was superior to steel. The sulphur content of the metal was set not to exceed 0.03 per cent and the manganese must not exceed 0.15 per cent.—F. C. Smith, Gas, April 25, 1928, pages 315 to 316.

	From a wrought iron low pressure service pipe. Weight in %.	From a four-inch cast iron main. Weight in %.
Loss on drying at 100 degrees C., including naphthalene	1.06	39.8
Heavy tarry matter	0.15	4.0
Carbon	0.0	2.24
Sulphur	0.0	3.0
Ammonium thiocyanate	0.15	0.0
Ammonium sulphate	1.17	0.4
Ammonium ferrocyanide	0.23	0.0
Ferric ferrocyanide	6.74	2.50
Ferric oxide and triferric tetroxide	90.00	42.70
Silica	0.05	4.96

STRENGTH OF WELDED PIPES

The requirements which have been set down as being essential in welding practice must be followed out, even though they may appear to be trivial. The author discusses mostly the methods and results of testing welded pipe to determine the effectiveness of the weld. Various observations are also made on the nature of certain welds made in various ways. It is emphasized that the metal of the weld must be built up above the surface of the pipe at least ten per cent. It was also observed that it is highly important for the welder to penetrate to the inner surface of the pipe in making the weld. It was found that if the penetration was within one-sixteenth of an inch of the inner surface, the efficiency of the welded result was only seventy-five per cent.

The author points out various weaknesses that exist in welds which are made in a certain manner and the entire is profusely illustrated. The article is written by Louis A. Foster and appeared in Domestic Engineering, April 14, 1928, pages 18 ff.



...1.—Standard joint for straightaway work, where ends are butted together. Long hub cast steel flange with butt weld to pipe at left, low hub ring flange at right. Cross of unequal diameters of pipe. Cross of equal diameters of pipe.

DESIGN AND APPLICATION OF TRAVELING GRATE STOKERS

The type of fuel used determines the kind of stoker to use if mechanical stoking is employed in the boiler plant. The following tabulation shows the proper type of stoker to use under different fuel conditions:

Fuel	Preferable Stoker
Anthracite coal	Traveling forced draft grate.
Coke breeze	Traveling forced draft grate.
Semi-anthracite coal	Traveling forced draft grate.
Semi-bituminous, coking coal	Underfeed and inclined overfeed.
Bituminous, coking coal	Underfeed and inclined overfeed.
Bituminous coal, free burning, high ash above 10 or 12 per cent.	Forced or natural draft traveling grate.
*Bituminous coal, free burning, low ash below 10 or 12 per cent.	Traveling grates, underfeed or side inclined.
Sub-bituminous coal.	Traveling grates, forced or natural draft.
Lignite.	Traveling grates, forced or natural draft.

*If ash fuses at a temperature below 2,400 degrees F., traveling grates are preferable. If the percentage of ash is less than 7, underfeed stokers are preferable. The term "traveling grates" is used to cover chain grates as well as traveling carrier bar stokers.

The essential details and principles of design and operation of natural draft stokers are described. The essential features of chain grate furnaces are: First, an arch to maintain high furnace temperatures and ignite fuel; second, admission of air at proper location and in proper quantity; third, means for mixture of air and gases distilled from the fuel; fourth, a chamber of sufficient size to provide time for combustion. There is a definite field for the use of the natural draft chain grate.

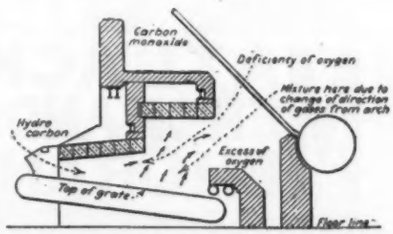


Fig. 1—Method of obtaining mixture of oxygen and hydrocarbon in chain-grate furnace by impingement.

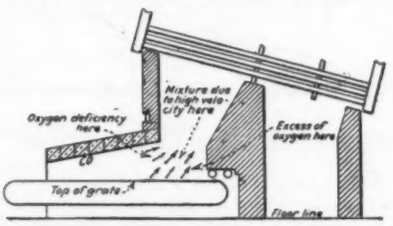


Fig. 2—Method of obtaining gas mixture in furnace by high velocity

Tabulations are given to show the various results obtained from different fuels used on natural draft traveling stokers.—T. A. Marsh, Power, Feb. 21, 1928.

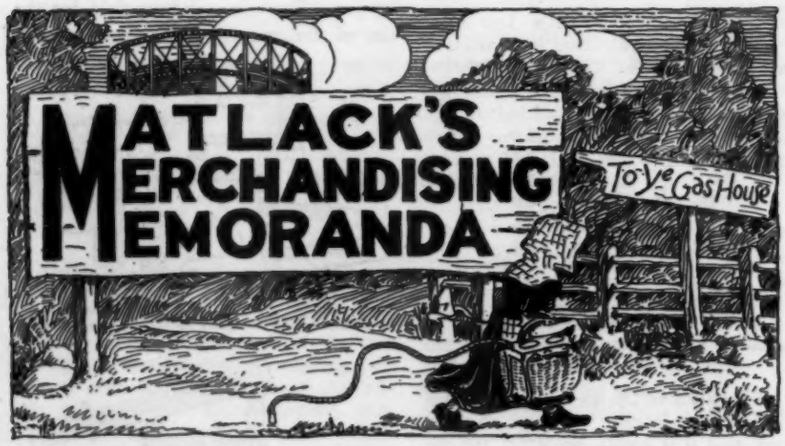
TRANSPORTING OPEN BARRELS

It often happens that when it is necessary to transport an open barrel containing liquid from one part of the plant to another the operation is carried out in a sloppy manner.

A device, which is suggested by R. M. Thomas in Chemical and Metallurgical Engineering, May, 1928, page 305, consists in placing a number or blocks of wood on the surface of the liquid. The floating blocks effectively prevent the formation of little waves which so soon grow into bigger ones to the sorrow of the man who is trying to move the barrel. This device has been found to be just as effective as providing the open barrel with a cover.

REMEDYING LOOSELY FITTING THREADS ON PIPES

It is very often found that in spite of the greatest care that can be taken, often in cutting threads on large pipe in a lathe there will be a loose fit between the male and female threads. A quick remedy is suggested as follows: A piece of 80 mesh woven brass wire netting, daubed freely with red lead, is wrapped tightly around the pipe over the threaded portion. This will conform to the shape of the threads and will fill the extra space airtight.—The Power Specialist, April-May, 1928, page 9.



WHY SALESMEN LEAVE HOME

It has been said that a great many men who were formerly employed in the sales departments of public service companies are now employed by furniture stores and as managers of the household departments of department stores. The reason is obvious—step into the office of the headman in the department store and inquire of him: "How do you compensate your merchandising and department managers?" To bring the matter home, there are too many 1928 sales plan and policies being carried on by men who are being compensated on a 1914 plan.

IDEAS BETTER THAN PUNCH

The New York Times is pretty well informed, and we would say, judging from the following from that daily, that old bunk-um, high pressure salesmanship is in for a hard inning. Folks are about ready to de-bunk the high pressure boys. Read what the Times says: "Everybody knows that the technique of selling has been highly developed in recent years. It has been the theme of textbooks and of schools of instruction. So far as outsiders have been able to grasp the principles of this art, it appears to be very forthputting and aggressive. All kinds of vigorous methods are studied and practiced in order to overcome that terrible thing 'customer resistance.'

"All the more welcome, accordingly, is the testimony of the head of a large textile concern. He found one of his salesmen to be sadly deficient in 'punch.' The man was not fairly dragging in customers, after the manner of a 'barker' on the Bowery. It was even thought that he would have to be dismissed. But while sorrowfully confessing that he was without the tremendous vitality of other salesmen, he professed to have some ideas about selling goods which he thought would work if they were carried out.

"They were, in fact, accepted and put into execution with a good deal of success. The result was that the employer opened wide his eyes at the discovery that 'ideas' were even better than 'punch' in salesmanship. That his tribe may increase will be the prayer of at least the victims of the impetuous ardor of the modern high-powered salesman."

This little piece may be well taken to heart by a goodly number of gas men who have put-on high pressure campaigns that turned out to be boomerangs when customer good-will was cast into the balance.

THE TRUTH OF THE MATTER

"This company is essentially a sales organization and its future success depends largely upon the realization of that fact by the entire organization."—B. J. Denman, V.P. United Light & Power Co. Atta boy! More sales per meter for you when they all understand that the principals are behind merchandising.

A JULY SUGGESTION

No matter what folks, the knowing ones, say, there is still those in the gas industry who disagree with the idea of ditching the circulating gas water heater.

"The month of July," says one gas man we know, "is a good time in our parts to sell tank heaters, and I always put on a last drive in July for 'em."

Thinking others may be of the same opinion, that the lowly tank heater is not to be "sneezed" at as a load builder, the following window trim is suggested.

The window is inexpensive and one that may be built in any gas company shop or by the new business manager himself, if he happens to be one of the many who design and build their own windows.

The background of the window is a painted one, even the sink is painted on the wall board background with water colors. If the window is large enough we would suggest that a sink be secured from some local plumber for use in the window.

The figure of the home-manager who has been made happy through the use of a circulating gas water heater and an upstairs clock is also cut out of wall board. The window features on cards the names of sixteen sales points on the heater at the left and the name of local celebrities at the right, the only other card (center) features the special low down payment and plan of monthly payments.

A window of this type is bound to attract attention and we are of the opinion that it would help to sell water heaters at any season of the year—and its cost would be so little that any gas company may well afford it.

ENGINEERS *and* BUILDERS GAS HOLDERS *and* TANKS

In the unprecedented time of Five and One-Half Months, the Ten Million cubic foot Natural Gas Holder shown here was completed recently at Long Beach, California.

The rapidity of erection, workmanship and methods employed have won for us unstinted praise, which verifies our claim to pre-eminence in this highly specialized field.

For High Pressure Storage, we present the "STACEY BULLET" as unsurpassed for sound engineering design, attractive appearance and low cost.

"ABILITY TO SERVE"

The STACEY BROTHERS Gas Construction Co.

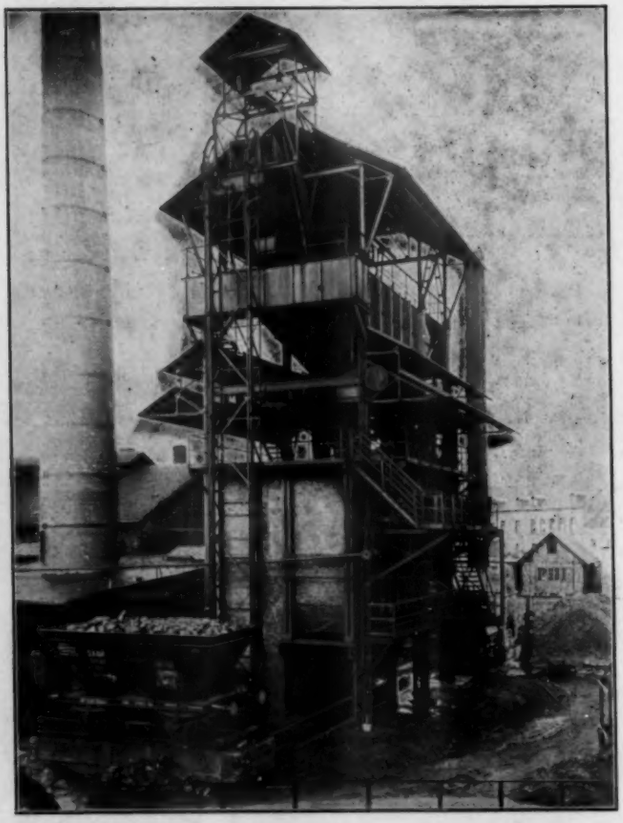
CINCINNATI, OHIO

JAMES E. STACEY, Pres. ANDREW J. STACEY, Vice-Pres. WAYNE STACEY, Gen. Sales Mgr.
ARTHUR A. POPE, Sec. and Treas. WILLIAM A. MILLER, Chief Eng. P. C. RODGERS, Asst. Sales Mgr.

NEW YORK OFFICE—75 West Street—P. F. McEnaney, Mgr. Tel. Bowling Green 8186

New England Representative—Eastern Service Co., Boston.

"INDUGAS"
VERTICAL CHAMBER OVENS
With Water-sealed Drop Door
INTERMITTENT TYPE



Minimum Labor
Low First Cost

The annual operating reports of the Association of Swiss Gas Plants disclose that the "INDUGAS" ovens produce the largest yields of gas per ton of coal.

The following table shows the actual average yields from coal containing less volatile matter than the average American coal:

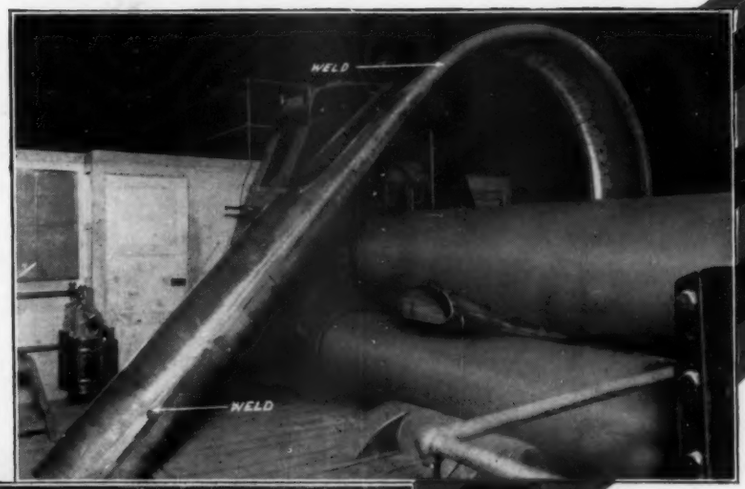
City	Time	Yield cu. ft. per net ton	Heating value B.t.u. (gross)
Baden, Switzerland	4 years average	14075	560
Olten, Switzerland	2 " "	13317	570
Friedrichshafen, Germany	4 " "	16045	515

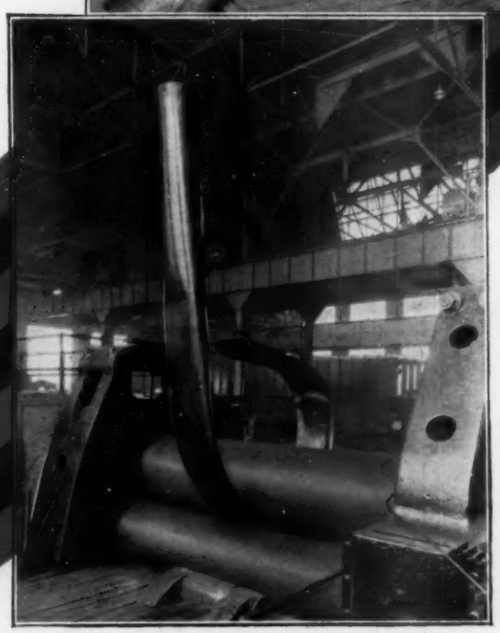
There's a Reason

Full information, layouts and estimates gladly furnished

CARL STILL CORPORATION
114 LIBERTY STREET, NEW YORK

Flattened Like an Empty Inner Tube





In a bending roll powerful enough to form 6 in. Steel Plates this length of Smithsteel Gas Line Pipe was flattened as shown. The weld was at the point of maximum bend — still not even a sign of a break.

A. O. SMITH CORPORATION
General Offices—Milwaukee, Wisconsin

Oil & Gas Field Products Division
District Offices at New York City, Pittsburgh, Tulsa, Houston, Los Angeles

SMITHSTEEL GAS LINE PIPE

ROOTS

Announcing

The NEW ROOTS METER

The P. H. & F. M. ROOTS CO.

CHICAGO
Peoples Gas Building

CONNERSVILLE, INDIANA

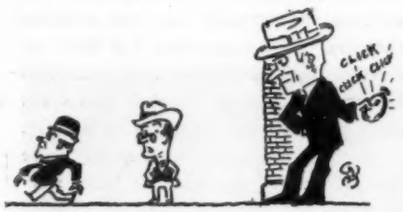
NEW YORK
120 Liberty Street

Originators of the Double Impeller Rotary Principle

Complete Information on Request

PEDESTRIAN TRAFFIC SURVEY

Here and there we hear a lot of talk about surveys. Recently a member of the staffs of the Parks Airway, East St. Louis, told of how some of the big chain store organizations employed aeroplanes to make surveys of downtown locations by making observations from a plane at different periods of the day. Another chain store employs men to take daily and hourly count with a hand meter.



Gas companies are now branching out, several cities have two or more gas company stores, and while the prime object in establishing these branch stores is for the convenience of existing customers in furnishing a place to settle accounts rather than to create them, we wonder if it would not be a very profitable thing if a little study of traffic would not be well worth the effort and cost when establishing new stores?

NO ROOM FOR THE TIMOROUS

Education by the operating companies and the manufacturers is the prime procedure in securing customer acceptance of any major appliance. If the gas man lets the matter of 15,000 or 18,000 cubic feet per year worry him, or if he fears a 20-light meter he may as well forget "greater per meter sales."

Gas refrigeration and automatic water heaters will be sold in 1928 and thereafter, to say nothing of incinerators and laundry equipment. Folks are getting all-fired tired of smoke and grime; more and more of them are demanding hot water service, mechanical refrigeration, the quicker, cleaner way to dispose of waste and garbage—and some one is going to sell them the appliances to make good these desires.

ENNUI

There seems to be a lot of smoke here and there and investigations appear to be in order. As a suggestion this month, why not investigate campaigns? There are, perhaps, a great many merchandisers who are coming to the opinion that there are too many campaigns and that to secure real volume at a profit the best procedure is to sell the whole line at all times and not try to run three campaigns or drives every month. "The industry and country is drive tired," is the way one man puts it.

CO-OPERATION

The Kansas Gas and Electric Company has hit the nail on the head in the Institutional advertisement we are reproducing on this page. Cooperation; "You scratch my back, and I'll scratch yours!" Brother, there's a lot of oratory reduced to simple understandable language. There is a basic idea that will enable the Blue Star Idea to go over; there is the idea that will promote more per meter sales, secure dealer cooperation, public good will and employee cooperation and interest in merchandising. As we view it, we should not indulge in "pussy-footing" on vital questions. We should lay all of our cards on the table, face up, and say what we think and ask for what we want, and say what we are willing to do to get it, and then shoot. If you have adopted the policy of "to hell with the dealer," all right; if you intend to court his cooperation, all right; if you are on the fence, get straight with yourself before you air your views.

A GOOD BOOKLET

"Important Facts That Every Gas User Should Know" is the title of a splendid booklet being distributed by the Consolidated Gas Company of New York. It tells the customer about appliances and service in a way that should be very helpful to all concerned. It is the best thing so far that we have seen along this line.

DON'T CHEAT YOURSELF

July is the month to think about the methods to employ to sell space heaters. It is a good time, too, to resolve that you have had enough of cut prices and to sell space heaters at a mark-up that will give you a fair profit. With color entering the fireplace and new designs there is no need in the world to start out to cut prices on space heaters. *Sell* them—anyone can give merchandise away.

SOME ADDITIONAL COLOR OPINIONS

Color in gas appliances has ceased to be news, and a number of merchants who purchased heavy on color are somewhat disappointed. "Color is a fancy," say some gas men, and accordingly they have been very careful to limit their stocks of colored ranges. Others have found some of the bright colors to be big sellers, while still others, and we might add the majority, find that color, especially the cool shades of green and green in combination with cream and grey are still capturing a number of customers.

Color in water heaters seems to make but little difference to the customer, and it is too early to say what may be expected from colored radiant heaters; however, if the choice, generally speaking, in range colors is as indicated above, we are of the impression that Radiantfires in maroon, green, and flemish brass will be very popular next fall.

DIGNITY

"There is a lot of dignity connected with this public service business," said the manager of an Atlantic States gas company. "You know we are anxious, of course, to sell a nice lot of ranges, but I

do not wish to do it in the way these furniture people do it. We must maintain the respect of our townspeople, and be just a little conservative."

This fine speech was addressed as a word of warning to a man who was about to conduct a special drive during said manager's sojourn in parts removed from the base of operations. The funny thing about it was the fellow who was given all this good advice entirely forgot it, or got mixed up on it somehow, and ran the first real *"hoops-m'-dear"* sale the town had ever seen staged by the staid old gas company. And the results, to quote the manager upon his return to the city after the sale, were "tremendous," and the strange thing about it, dignity was entirely forgotten. We assume the old clink in the till caused dignity to take a back seat.

TO ALL SALESMEN

Plutarch said: "Water continually dropping will wear hard rocks hollow," and while this bit of obvious information was set down some time between 46 and 120 B. C., it is literally true today.

Repetition brings results, especially in selling.

Someone has made a careful analysis of the results accruing from salesmen's "repeat calls" and found that "eighty-four per cent of the men who sell merchandise (wholesale and retail) automatically eliminate themselves from consideration of sixty per cent of the business to be had simply because they quit before the customer had been brought up to the point of buying."

In other words, eighty-four per cent of the men who sell are good promoters, but fail to follow through.

We have had cases recently where a live prospect was developed, the first call made, and the prospect card returned marked, "Not ready to buy now, call about the 15th of next month," but, for some unknown reason, the call was not made for sixty days, and then it was found that an orphan appliance held a cherished place in the home—sold by some man who had "called back."

We implanted the seed of desire, introduced our appliance, a care-free gas range, but because we failed to make a consistent follow up, we lost the sale.

Now, boys, let's get down to facts. Look at the investigation; here are the figures: Out of 100 salesmen interviews, 46 made one call and quit, 25 made two calls and quit, 15 made three calls and quit, 12 made four calls and quit, yet sixty per cent of the sales were made after the fifth call.

This brings me back to old Plutarch and persuades me to paraphrase him by saying, "Persistent plugging will eventually push the prospect's pencil along the dotted line."

The prospect who says "No, not today," often contributes to your commission sheet after the fifth call.

We are at the tail end of the year, the last half is with us, so let's keep on calling back on our prospects until we sell them or they buy elsewhere. Let's start in today to make additional calls back. Let's get ready to have a big Christmas, by piling up sales now while the weather is right.

You know it to be a fact that the ideal time to sell is when people are in a buying mood. Everyone is in a buying mood at this season—cash in on it—call back. Get the idea that persistent plugging will eventually push the prospect's pencil along the dotted line firmly implanted in your mind, and Oh, boy! how sales will roll in.

Yours persistently,
Sales Manager.

P. S.—I assume that you are all interested in larger commissions—continuity or "call backs" on your prospects makes this a certainty. Nufsed.

GO GET 'EM!

The Natural Gas Industry is going in for merchandising in a big way. That is the thing to do. Sell merchandise and sell it as other merchandisers do—to make a profit. Such a policy will maintain dealer activity and cordial relations. Before undertaking to sell merchandise make a survey of your market, study the methods employed by merchandising utilities in other sections, and then employ the best talent you can find to do the job. Cheap men have cheap methods. Out and get them, big boy!

FORTY BILLION A YEAR!

According to a recent advertisement of N. W. Ayer & Son, there are 25 million households in America wherein 40 billion dollars' worth of merchandise is purchased each year. The home manager is this big purchasing agent. "Always they visualize the ideal, these wives and mothers, before they consider economies. But they watch for economies as few business men do. By aptitude and training they are excellent shoppers. The competition for their attention, the courting of their favor, is tremendous. The way to their hearts and their purses is not easy, but it is clear. It has been estimated that they buy more than eighty per cent of all advertised merchandise."

You may be sure that the advertising that sells this gigantic purchasing agent is thoughtful advertising, not just ads, but IDEAS. Put 'em in your ads—to sell.

SALES MINDED

Sales Minded don't mean that the whole works should be sales managers. If the management becomes sales minded it is the most helpful thing that may happen to an organization—unless it gets to the point where it runs the sales department.

When a man is employed to manage a sales department remember that that is his job and if he is worth his hire he should be given full swing. On the other hand, if he is not the proper man, get another, in justice to the man and the organization.

IT IS TO WEEP

The following item from the New York Herald-Tribune as of June 22, 1928, might be of melancholy interest to gas merchandising men:

"Army housewives who have been struggling with wornout gas, wood and coal ranges are going to receive electric ranges. The War Department announced today that 1,900 electric ranges had been purchased and would be distributed to posts in the United States. Later, housewives in military posts in the insular possessions also will get them."

Mr. Gas Man, what are we going to do about such matters?

A Big Message in a Few Words

Wherein the window shopper is given credit for some brains

By Ray Martin

Chairman Window and Store Display Committee, American Gas Association

SIMPLICITY is, without a doubt, the most desirable quality a window display advertisement can possess. Justly, the uninvolved display receives more attention because it is considerate of people's time. There is no chance of monotony in the message it presents, because its aim is to bring home just one thought. The observer is not burdened with statistics, whys or wherefores—simply, "Wishing does not bring hot water."

This type of display is most effective when employed to advertise an appliance that needs little introduction. Water heating is a case in point. Most gas companies have already advocated the gas water heater sufficiently to make further lengthy preambles somewhat boresome. Therefore, why continue to stress obvious advantages?

The display that expresses one impellent idea leaves more of an impression on the observer than its cluttered rival. Regrettably, we are occasionally forced to express several ideas in one display, especially when a new appliance is being introduced. However, it is advisable to single out the individual selling points of any given appliance at the earliest possible moment, devoting an entire window display to each in turn.

If your displays have a tendency toward much copy, remember that it is possible to produce this type of advertising without the use of a single word. It is extremely difficult, but it has been done. Every word added detracts slightly from the display, so that when an innocent customer is asked to look at thirty or forty words his interest wanders. Illustrations can frequently be used to reduce the amount of the copy. Not infrequently a figure can express a complete idea. Such a figure supplemented by the tersest copy constitutes, in the writer's opinion, the ideal window display advertisement.

Limiting Factors for Natural Gas Projects

(Continued from page 50)

TRANSPORTATION COSTS—

Case C—300 miles of 16-in.—400 lbs.—10,000 lbs. line @ $4,210	$1,263,000.00
16,000 H.P. of Compressors @ $32.50	520,000.00
18% on $500,000 extras	90,000.00
Total Except Management and Gas	$1,873,000.00
Management ¼c. per M.C.F. on 9,357,500 M.C.F.	70,100.00
Total Transportation Costs	$1,943,100.00
Average Per M.C.F. on 9,357,000 M.C.F.	20.8c

TRANSPORTATION CHARGES PER M.C.F. CLASSIFIED—

	Per Cent.
Proportion of Domestic and Unaccounted for sales to total	25.2
Proportion of Unaccounted for to Domestic sales	15.0
Proportion of Industrial sales to Total sales	74.8

$$\text{Domestic Load Factor} = \frac{2{,}050{,}000}{27{,}750 \times 365} = 20.25\%$$

Unaccounted for Load Factor..... 100.00%
Industrial Load Factor..... 70.00%

Domestic: (Eq. 2)

$$\frac{\$1{,}943{,}100.00}{.2025 \times 9{,}357{,}500} \div \left\{ \frac{.252}{(.15+1).2025} + \frac{.15 \times .252}{.15+1} + \frac{.748}{.70} \right\} = 46.92\%$$

Unaccounted For: (Eq. 4)

$$\frac{\$1{,}943{,}100.00}{9{,}357{,}500} \div \left\{ \frac{.252}{(.15+1).2025} + \frac{.15 \times .252}{.15+1} = \frac{.748}{.70} \right\} = 9.505\%$$

Industrial: (Eq. 6)

$$\frac{\$1{,}943{,}100.00}{.70 \times 9{,}357{,}500} \div \left\{ \frac{.252}{(.15+1).2025} + \frac{.15 \times .252}{.15+1} + \frac{.748}{.70} \right\} = .13.58\%$$

COST OF GAS AT CITY GATE—

To the above must be added the price per M.C.F. in the field. The loss in transportation and compressor station fuel having been allowed for in the respective operating cost figures.

Some Thoughts on Advertising

By Hylan Piper

THE other day a gas man who has recently taken charge of the selling end of the business, asked us: "How often should we advertise?" Quite a question, you will agree; one that raises a great many other questions.

Obviously, an advertiser should advertise as often as he has something to advertise, and in the gas appliance business and the gas business he always has something to advertise. How often he should advertise appliances, however, must be considered on a basis of what he can afford to spend. Also there is the question of how can he advertise? What mediums can he employ: daily, semi-weekly, or weekly newspapers, direct mail, gas-bill stickers, window displays, bulletin boards, car cards or house organs? These questions once answered, the matter is simple.

It has been said that gas merchandise sales per meter run from $2 to $7, with a good average of around $4.50 per year. So to work with the average let us assume that merchandise sales are $4.50 pet meter per year and proceed from that point to see what can be done in the way of advertising gas appliances.

When we investigate we find that the allowance for merchandise advertising is apportioned on a basis of from two to four per cent of the estimated net sales. Hence, in order to keep in step with averages, we will use three per cent of our estimated net yearly sales as the amount we are to use for advertising. This will furnish a basis for arriving at about how often one should advertise.

Assuming that we have 10,000 meters and that we estimate our net sales to be $4.50 per meter per year, our total net sales then for the twelve months would be $45,000, or $3,750 per month, average. Using this amount and setting aside three per cent of it we would have $112.50 per month to spend for advertising.

Now in a city of 10,000 meters let us assume that we have a population of 50,000 people. This population calls for one or two daily newspapers which have a contract rate of somewhere around four cents per line. This would mean that if we spent our entire appropriation for newspaper advertising we would secure a little more than 2,812½ column lines, or 200 inches plus per month. That is a respectable amount of space and would make a nice spread, yet we cannot be expected to expend our total appropriation for newspaper advertising; so, for example, let us assume that we will use 70 per cent of the amount, or $78.75 per month, for newspaper advertising, leaving the balance, 30 per cent, or $33.75, for other forms of advertising. This amount, unless we spread ourselves on direct mail or special window display advertising, would permit us to carry on.

Frequency of Advertising

Getting back to how often we should advertise, let us follow good practice and advertise say three times each week. This would then necessitate our doing a little research work to enable us to determine the days on which to advertise, also on what day to use our greatest amount of space, or still, whether it would be more profitable to run advertisements of the same size on each of the three days chosen.

These days should be decided upon and determined by the shopping habits of our community; on what days the department stores and other large retailers advertised and the size and character of the advertisements they used. Pay days also should be taken into consideration, for ready money buys most merchandise, notwithstanding the growth of the deferred payment plan of selling. We want that down payment and the average man today only has it on or the day following pay day.

In talking to a great many utility merchandisers we find that the opinion seems to be pretty general that utility merchandise advertising does not enjoy a favorable response from Saturday shoppers. In some sections of the country Monday is said to be a good day, as well as Wednesday and Friday, while in other sections it has been found that Tuesday, Wednesday and Friday are the best days. In the former case the utilities advertise Monday, Wednesday and Friday. It was also brought out that the first class named use the evening newspaper, while the latter use a morning paper. This, no doubt, explains why they use advertising on two of the days on which it is claimed that business is best.

These facts now bring up the question

of which edition, morning or evening, is the best for the appliance advertiser. This can only be satisfactorily answered by individual results, for, notwithstanding what may be accomplished by a morning paper in one city, it may be directly offset by the evening newspaper in a city not fifty miles distant.

As we view it, continuity is the major contributing factor to utility merchandise advertising's success, assuming copy and attraction value to be average, and by this we mean not alone continuity of schedule, but continuity in the amount of advertising devoted to a given appliance. Where the advertiser is compelled to use small space it seems advisable to advertise several items in one large advertisement, featuring the items upon which he is desirous of obtaining the largest volume, and following this ad. up with smaller ones given over entirely to the feature item.

Sunday Newspaper Preference

Several appliance dealers with whom we have talked expressed a strong preference for Sunday newspapers; others are firmly of the opinion that Monday is the most opportune day and the day on which to make their spread. All are agreed that they try to choose the days when, in their opinion, women have the most time to read. Those preferring Sunday say that the whole family has time to read on Sunday, and that even when they go to the country or elsewhere for a day's outing the Sunday paper accompanies them and that they find time to read it. Those who prefer Wednesday say: "The housewife has very little time before the middle of the week to read," while those who prefer Friday say, "It is the day before pay-day, and in anticipation of having ready money both men and women read the Friday paper." So it goes, and so it shows that we must do some investigating to ascertain just which is the best day or days to advertise in our town.

As to other forms of advertising, a great many gas and electric men feel that the bill sticker is a good medium if it is not over-worked. Users of this form of advertising say that it should not be used over four times a year, and then only to announce some special offer (these are the men who advocate not more than four intensive sales drives per year). Other progressive appliance dealers that we have interviewed and whose appropriations are small say that they find window display advertising their most productive medium. One man told of a test he used to prove to his principals the value of window display advertising. This man chose a gas range for the test, displaying it in one of his windows for one week without saying anything to his sales force about any special effort being made to sell it, and without doing any newspaper or any other form af advertising. After displaying it in the window he sat by and watched and kept careful check on the sales of the particular range. He found that it won out. Since that time he has had no complaint from the boss when he spent a little extra money for a window display advertisement. That windows should be changed frequently is the consensus of opinion of all wide-awake dealers we have interviewed. The general opinion is that display windows in cities having a population up to 50,000 should be changed once each week and at least once in every two weeks in the larger cities to secure best results.

As far as the advertising furnished by manufacturers is concerned, we find a wide diversity among utility men as to which is best. In one instance we found a man who said he would not use broadsides under any consideration. "They are a waste of money," he said, "and as a rule they play up the product in such a manner that we do not derive the benefit that we feel we should. Again we have seen some of this type of advertising that we felt was misleading to all but the very closest of observers. It is the type of advertising that one direct mail advertising man says is intended 'for fools and farmers,' and we cannot see that any representative organization can afford to have their imprint affixed to any such advertising." This man also claims that the mail that comes to his home is flooded with broadsides and that they are simply feed for the waste basket. Another man interviewed said: "We use a great many single fold inserts, sending them out with our statements and merchandise bills, and we always have a supply of that type of advertising in racks on the sales floor. We are always glad to have these convenient folders and tested recipes furnished by a number of the stove companies, and we see to it that they are wisely distributed from the floor and by our home service department."

Another's Viewpoint

Another man that we talked to said that at this time he was only using the small leaflets furnished by the manufacturer. "I decided," he said, "after two mailings of several thousand broadsides that they are not productive. One of these broadsides contained a coupon while the other contained a return card, and I would hate to tell you the number of returns we had from either of them." This man supplies his salesmen with leaflets to distribute to every person called upon and he also has a rack near the entrance of the store and another at the customers' counter that are always filled with folders. Where house heating furnaces and boilers are being sold by gas companies the House Heating Booklet is in high favor.

These booklets are strictly gas company products, and as a whole are a very creditable lot of publications. They range in size from eight by ten inches to four by five and contain anywhere from ten to sixteen pages. Photographs of actual installations and cost figures are most generally used and the text dwells mainly on the value, cleanliness, efficiency and reliability of gas for fuel as well as illustrates the various systems to be had.

The home service department is another department that produces most of its own advertising material. In a great many cities this department employs the multigraph to produce recipes and special programs and menus, while in other cities menus and recipes are printed on a regular flat bed press. Some of the larger companies even go in for four color jobs. Naturally the larger the company the more money they spend for advertising and the more elaborate becomes the advertising. Other companies use the radio, and all of these expenditures should be charged to advertising in some form—probably not entirely to merchandise advertising, however.

Give Advertising a Chance

So while we may have seemed to ramble about a great deal we have done so to illustrate how involved the question, "How often shall we advertise?" really is—how big it is, and how appropriations must be stretched to cover the half of advertising. And with all this we have not touched upon all that maze of stuff that is offered in the way of "donation advertising," but that subject and its weak spots should be the subject of another article. After all, we have covered but three types of advertising and then only briefly. Painted bulletins, car and truck cards and "trick" advertising, too, need another article. However, all these forms will of necessity have to be squeezed into your appropriation.

In leaving this subject we would like to say that if you expect your advertising to be productive, give it a chance, have it prepared by someone who has made a study of advertising and has had some experience in advertising, not by just anyone who has a "knack" with the shears and paste pot. Every one is not an advertising man any more than every one is not an engineer or chemist, and surely one would not employ inexperienced men for either of these positions, yet you will let most anyone who is handy with bold face type undertake to make good on the job of advertising. This applies to window display advertising as well as direct and newspaper advertising.

It has always seemed strange to us that a utility will expend many thousands of dollars in the course of twelve months on "new timber" for personal solicitation and selling and absolutely refuse to pay one good man a livable salary to handle their newspaper, direct and window display advertising. If the man that can do this class of work is not profitable, we wonder why Marshall-Field, Wanamaker, Macy and some of the other successful merchandisers have not discovered it?

Association Activities

A. G. A. and affiliated gas associations' sectional activities and convention calendar

Usual Success Attends Canadian Gas Association Convention

IT is now twenty-one years since the first annual meeting of the Canadian body, and yet each convention seems to be bright, optimistic affairs from first to last, and the one just closed was not behind its predecessors in the kind and quality of the good things dispensed during the two days of June 21 and 22 at Hamilton, Ontario.

Only one thing that added a measure of sadness to the convention was the fact that the late P. V. Byrnes, who at the time of his death was president of the Association, was not spared to enjoy the meeting which he had looked forward to with a great deal of pleasure. Mr. Frank Elcock, of Ottawa, Ontario, vice-president of the Association, acted as chairman during the sessions, and following the elections was made president of the Association for the year 1928-1929, while Kenneth L. Dawson, superintendent of the Nova Scotia Electric and Power Co., Ltd., Halifax, N. S., was made first vice-president. A. T. Leavitt, president of the Hamilton By-Product Coke Ovens, Ltd., being made second vice-president. G. W. Allen was reappointed secretary-treasurer. The executive committee, composed of eight members, to remain as at present.

The convention proper opened Thursday morning, June 21, with the address of welcome to the visiting delegates, Acting President F. Elcock expressing his pleasure at seeing such a good attendance and trusting their stay would be a pleasant and profitable one.

The secretary-treasurer's report followed, proving that the past season was one of the most successful financial year's in the Association's history, the membership also showing a substantial increase.

The balance of the morning was taken up with the reading of some excellent papers. After luncheon the delegates were taken by autos to the Hamilton By-Product Coke Ovens and Benzol Recovery Plant where a very instructive two hours was spent in going over this remarkable Canadian coking unit.

Returning to the Royal Connaught Hotel the delegates assembled for the usual annual banquet. Many prominent gas men from Canada and the United States took part in the proceedings, and among the speakers might be mentioned: R. M. Conner, director, American Gas Association Testing Laboratory; Kurwin R. Boyes, secretary of thhe American Gas Association; Arthur Hewitt, Toronto, Ontario; Judge John G. Gauld, Hamilton, Ontario, and A. T. Leavitt, Hamilton, Ontario. Arthur Hewitt acted as toastmaster.

The second day's session was held in the morning of Friday, the 22nd, and was taken up with the reading and discussion of the remaining papers on the program. The executive committee report being also read showing a busy year. The nominating committee for the election of office bearers for the ensuing year also brought in its report, which, when put to the meeting, was unanimously endorsed.

Papers read included the following:

1. The New Plant of the Montreal Coke and Manufacturing Co., by D. G. Munroe, vice-president and general manager of the company.

2. The Evolution of the Water Gas Machine, by Frank F. Steere, vice-president of the Semet-Solvay Engineering Corp., New York, N. Y.

3. Motor Benzol Manufacture—Hamilton By-Products Ovens, by Geo. W. Crupe, consulting engineer of the company.

4. Some Experiences in Industrial Survey Engineering in Canada, by Geo. W. Allen, industrial survey engineer, Toronto, Ontario.

5. Coke As A Fuel, by John T. Byrnes, vice-president and sales manager of the Hamilton By-Product Coke Ovens, Ltd., Hamilton, Ontario.

6. The Bubble Holder and Its Place in Modern Gas Distribution, by George T. Horton, president of the Horton Steel Works, Bridgeburg, Ontario.

7. High Pressure Gas For Industrial Purposes, by O. L. Maddux, industrial gas engineer of the United Gas and Fuel Company of Hamilton, Ltd.

8. Experiences With the Waterless Gas Holder at Toronto, by William Gardner, inspector of holders of the Consumers' Gas Company of Toronto.

9. What Quality Does the Domestic Consumer Want in Coke, by F. W. Smelts, manager, coke sales division, British Columbia Electric Power and Gas Co., Ltd., Vancouver, B. C.

During the afternoon of Friday a number of delegates took advantage of an invitation to visit several outstanding industrial gas users. The United Gas and Fuel Company, of Hamilton, Ontario, has made some remarkable installations of late along the lines of high pressure gas appliances and equipment, some of the customers having contracted for gas in quantities from 10,000,000 to 25,000,000 cubic feet per month each.

The next convention will be held in Ottawa, Ontario, June 13 and 14, 1929.

Convention Calendar
July

5- 7 Michigan Gas Association. Annual meeting, Grand Hotel, Mackinac Island, Mich. Albert G. Schroeder, Grand Rapids, secretary.

9-12 Annual Convention of the Public Utilities Advertising Association, Detroit, Mich.

27 Summer Meeting Midwest Industrial Gas Sales Council, Palmer House, Chicago, Ill.

Pennsylvania Natural Gas Men's Association Affiliates With A. G. A.

The Pennsylvania Natural Gas Men's Association is now affiliated with the American Gas Association, according to announcement by Oscar H. Fogg, president of the A. G. A.

The Pennsylvania Association is the second natural gas association to become affiliated with the A. G. A. since the amalgamation of the Natural Gas Association of America with the A. G. A. It is the seventeenth group to be added to the roster.

The following are the officers of the Association: President, Geo. Wittmer, Jr.; vice-president, Geo. Whitwell; secretary-treasurer, E. J. Stephany. The directors are H. J. Crawford, Philip Dixon, T. B. Gregory, Alfred Hurlburt, Geo. E. Welker, Geo. E. Whitwell, S. W. Meals, B. D. Phillips, E. S. Templeton, J. B. Tonkin and Geo. Wittmer, Jr.

The Pennsylvania Natural Gas Men's Association was organized about four years ago by the heads of several natural gas companies in Western Pennsylvania. Dur- presidents, and Mr. Stephany has acted as ing this time it has had four different secretary.

The following appointments to A. G. A. section managing committees have been announced:

Accounting Section—A. J. Newman,

Columbia Gas & Electric Co., Pittsburgh, Pa.

Commercial Section—P. L. Mulkin, United Natural Gas Co., Oil City, Pa.

Industrial Gas Section—E. F. Koch, Peoples Natural Gas Co., Pittsburgh, Pa.

Publicity and Advertising Section—H. A. Gager, Manufacturers Light & Heat Co., Pittsburgh, Pa.

Technical Section—B. F. Wylie, Carnegie Natural Gas Co., Pittsburgh, Pa.

Three Weeks' Summer Course in Gas Equipment, July 9-27

DURING the summer session of 1927 the American Gas Association cooperated with Teachers College, Columbia University, in offering a three weeks course in gas equipment, designed especially for home service directors. This course was so well attended and the results so gratifying that a similar course will be offered again this year, but has been somewhat broadened to include women in the industry who are engaged in selling appliances.

The course consists of practical laboratory and lecture work and deals with every phase of the use of gas for domestic purposes, as well as its manufacture and distribution.

The laboratory work is under the direction of Dr. C. J. Lynde, head of the department of physics and household engineering of Teachers College. Dr. Lynde has had many years of experience in the teaching field and is unusually well fitted to direct such a course. For the past three years he had conducted a somewhat similar course for graduate students at Teachers College. His book on "Household Engineering" is a standard reference book for every home service director.

Any additional information regarding the courses will be given by Miss A. Deane Dowell, Home Service Counsellor, American Gas Association, 420 Lexington Avenue, New York City.

A Special Course for Men in the Gas Industries—Second Year, 1928-29

A COURSE of twenty-six lectures, five works inspection trips and twenty laboratory sessions dealing with the principles underlying the manufacture, distribution and utilization of manufactured gas and their applications will be given at the Brooklyn Polytechnic Institute.

After a brief review of the past history of the industry, the lectures proceed to a consideration of the general physical laws of gases and the chemical processes of combustion and gas making; these studies will be amplified by experimental work done during the laboratory sessions. Gas manufacturing processes will then be taken up in detail, including a study of raw fuels used, equipment required, methods of operation, properties of the products made by the different processes, the purification systems used, the by-products obtained, and the chemical methods of controlling quality.

Distribution systems will then be studied, covering the portion of the industry devoted to delivering the gas from the works to the consumer, and including holders, compressors, boosters, mains, valves, services, governors, meters, and pressure survey and control.

Combustion processes will receive more detailed attention, also methods of measuring heat and temperature, both leading to a study of the principles governing efficient combustion in gas-fired apparatus. Actual systems of supplying air and gas for combustion will then be studied, followed by furnace design, construction and performance, refractories and insulators, heat transfer, and furnace efficiency.

Consideration of the economics of fuel utilization in general will lead to a discussion of the economic characteristics of the various methods of producing heat. Industrial heat treatment processes, metallurgical and otherwise, and the use of gas in the home, will be given attention, also laboratory tests of the efficiency and safety of gas-burning appliances.

Three concluding lectures will deal with general topics of importance in the gas industry including accounting, future trends, and service relations with the public.

The twenty laboratory sessions are planned with a view to exemplifying the more important of the general principles involved, and are divided into four groups:

Group 1. Physical properties of gases.

Group 2. Chemistry and heat of combustion, gas analysis.

Group 3. Pressure, temperature and volume measurements of gases; compression and flow of gases.

Group 4. Furnace operation, regulation and performance.

The apparatus of the physics, chemistry, heat treatment, forge, foundry and mechanical laboratories of the Polytechnic Institute will be available for this work. The class will be divided into three groups working on different evenings, and each group will be divided into small squads so that every student will receive individual attention from instructors.

The course is open only to high school graduates and to those who have had the equivalent of good high school courses in physics, chemistry and mathematics. The student's rating will be dependent on attendance, problems solved, laboratory notes and reports and grades received on tests held at intervals throughout the year.

The instruction in the course will be given by members of the teaching staff of the Polytechnic Institute, assisted by specialists chosen from the gas industries, under the direction of Professor Edwin F. Church, Jr., head of the department of mechanical engineering. The hours are as follows:

Lectures: Thursdays, 6:30 to 7:30 P. M., beginning September 27.

Laboratory sessions (one per week required).

Section I. Thursdays, 7:30 to 10:00 P. M.

Section II. Mondays, 6:30 to 9:00 P. M.

Section III. Tuesdays (or Wednesdays),, 6:30 to 9:00 P. M.

First laboratory session: Thursday, October 11.

For further information, application blank, etc., apply to your company representative who will also transmit your application to the Polytechnic Institute.

Subjects to Be Discussed at Mid-West Sales Council

There will be a round-table discussion on the following subjects at the Mid-West Sales Council:

"Enameling," by Hale G. Clark.

"Gas in the Studebaker Plant at South Bend, Indiana," by C. H. Lekberg.

"Industrial Sales," by D. Campbell, Eclipse Fuel Engineering Co., Rockford, Ill., formerly with Kansas City Gas Co.

Natural Gas Supply Men's Association Turns Over Tidy Sum to A.G.A.

A total of $17,032.25 has been turned over to the American Gas Association by the former Natural Gas Supply Men's Association, Inc.

In accordance with the terms of the agreement, which was duly executed between the officers of the Natural Gas Supply Men's Association and the American Gas Association, this amount will be held in trust by the American Gas Association in perpetuity for investment and reinvestment. The proceeds are to be used for purposes to be designated by the Natural Gas Department of the A. G. A., bearing in mind the recommendation of the donors that the proceeds be used for educational purposes if practicable.

In gratefully acknowledging the gift for the American Gas Association, Alexander Forward, managing director, wrote as follows to T. C. Clifford, Pittsburgh, Pa., treasurer of the supply men:

"In behalf of the officers and directors of the American Gas Association, and indeed of its entire membership, I express our appreciation for the confidence placed in our organization, and our congratulations upon the liberal and constructive attitude of the former members of the Natural Gas Supply Men."

Members of the Natural Gas Supply Men have been sent copies of Mr. Forward's letter to Mr. Clifford.

Equipment News

A New Appliance for Converting Coal to Gas Fired Furnaces

The Scientific Heater Company, Cleveland, Ohio, recently announced a new appliance which is of importance to the move for heating more homes with gas.

It is called the Scientific Gas Economizer and is an attachment for gas-equipped coal furnaces converting them into efficient gas furnaces. In their literature they state:

"Furnaces designed for coal do not have sufficient heat transmitting surface and flue travel to extract an efficient percentage of heat from the combustion products. You can achieve perfect combustion, that is, perfect 'generation' of heat from gas in any coal furnace. But you cannot get anywhere near perfect 'transmission' of the heat which is 'generated.'

"Dampers, baffles and the like cannot possibly be substituted for the heating surface which coal furnaces need for gaseous fuel. The only remedy is to add to the coal furnace the additional and properly arranged heating surface and flue travel which a furnace must have if it is to efficiently employ gas.

"The 'Scientific' method of converting coal furnaces is to install any good burners in the bottom of the fire pot of the coal furnace, employ no dampers or baffles, but giving the gas every opportunity to be completely burned without contact with the sides, or without employing fire clay nuggets, checker work, etc. The waste products of the furnace are then passed through the Economizer which extracts so much of the heat which would otherwise be wasted that 80 to 90 per cent efficiency is accomplished.

"The Economizer contains scientifically-arranged heating flues. Air passes upward between these flues and into the furnace. In this way the heat is extracted and reclaimed from the waste gases.

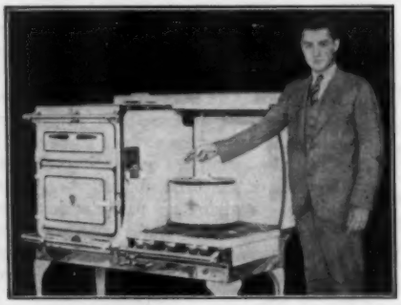
"The importance of the Scientific Gas Economizer will be realized when one considers how greatly the sales resistance to house heating jobs is reduced: When you approach a householder to heat with gas (unless the Economizer is presented), you must first persuade him to throw away his present furnace—to scrap what he regards as a valuable asset—to rip his present heating plant apart and lay out quite a sum for the installation of a gas furnace. Quite a sales undertaking.

"But where you have this new Economizer, your prospect retains everything he has. His present furnace and heating plant remain intact. In a few hours—a day at the most—the necessary additions to his furnace are completed and he is ready to heat with gas. His immediate outlay is a reasonable one."

A descriptive booklet may be obtained by addressing the company.

"Autostat" New Control Device on Chamber Gas Ranges

The Chambers Manufacturing Company, Shelbyville, Indiana, announce a new control device for Chambers gas ranges, which is called the "Autostat." The purpose of the "Autostat" is two-fold. First, to turn off the gas completely at any predetermined temperature and, second, to close the dampers of the oven so that the



heat will be retained. A chart showing the various temperatures required to cook various foods is attached. The operator points the arrow on the "Autostat" to the kind of food on the chart she wants to cook and lights the gas. When the correct temperature for that particular kind of food has been reached in the oven, the expansion bar operates the mechanism so as to not only shut off the gas but also to close both dampers. Descriptive booklet will be sent on request.

Silica-Gel for Refrigeration

The last five years have seen a tremendous growth of artificial refrigeration and the electric companies have reaped the greater part of the harvest. In fact artificial refrigeration and electric refrigeration had become to be almost synonymous in the minds of the buying public, though gas has been utilized to a certain extent.

But now comes a new type of refrigeration which utilizes gas and which simplifies and cheapens the process, doing away with all moving parts in the refrigeration cycle. The only moving part is a small electric fan, which is virtually an auxiliary being utilized merely to help cool the condensing unit.

This new type of refrigeration is the Silica Gel system, which is being manufactured by the Copeland-Silica Gel Corporation, of Detroit, Michigan, a subsidiary of the Copeland Products, Inc., manufacturers of electric refrigeration.

The new process is simple. In brief, the Silica Gel replaces the compressor of an electric machine, thus eliminating the driving motor and its constantly moving parts. Silica Gel exercises the principle of capillary attraction. Chemically Silica Gel is silica (SiO^2), but it differs from ordinary silica in its molecular arrangements. Looked at under a powerful magnifying glass it appears like a heap of marbles. It is the spaces between these "marbles" that do the work. They exert capillary attraction, and it is capillary attraction which is harnessed to do the work.

The Silica Gel apparatus operates on the dry adsorption and is intermittent in action, but the parts are so proportioned and action regulated by time clock and automatic control that uninterrupted refrigeration is obtained.

The Silica Gel, contained in steel tubes, is used to maintain the refrigeration cycle. Through its capillary attraction the Silica Gel adsorbs the refrigerant vapor. Heat is then applied to expel the refrigerant from the gel. It is done through a gas burner, operated by a time clock which shuts off and turns on the gas when needed.

As the Gel is freed from the refrigerant, this refrigerant passes on to the condenser where it liquefies and is conveyed back into the cooling chamber just the same as in the compression type of machine.

Silica Gel has been used for some time in refrigerating cars, utilizing Pintsch gas, and has functioned so perfectly that it is possible to load a car of fish on the Atlantic seaboard and ship direct to Texas without reloading. Heretofore it had been necessary to reice at least once along the way. A temperature of 10° below zero was maintained.

The new Silica Gel refrigerators are to be confined at first to the commercial type, such as boxes for meat markets, soda fountains and for multiple installations in apartment houses.

Strache-Kling Calorimeter

In the Strache-Kling portable calorimeter air is the heat-absorbing medium. The rise in temperature of this air due to the combustion of a definite quantity of gas as compared to the rise in temperature of the same quantity of air when pure hydrogen is burned gives the heating value of the gas.

In the Strache-Kling the gas is measured dry with a pipette and the air volume is fixed by the cubical content of the bomb.

Three pipettes of different sizes are furnished with the instrument. The gas-air ratio of the mixture when charged into the bomb is 1:3 for the largest, 1:5 for the second and 1:7 for the smallest.

Each of these pipettes has been standardized with pure hydrogen or a mixture of pure hydrogen and pure methane. By a series of determinations a factor is found for each of these pipettes.

The operation is as follows:

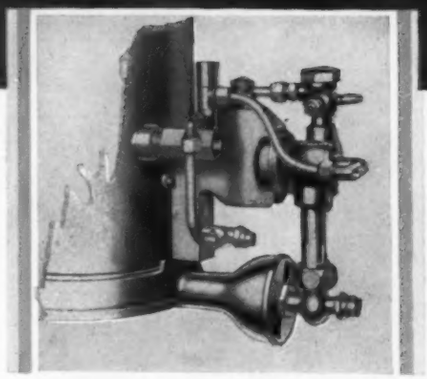
The gas to be tested after measuring by the most suitable of the three pipettes is swept into the bomb by air. After closing the bomb by means of a stopcock it is exploded and the rise in temperature observed by means of a differential thermometer. After making the necessary corrections for gas volume by correcting for temperature

NOW • ANOTHER NEW ACHIEVEMENT

WITH distinct pride and satisfaction we announce the introduction of the New Rex-Patrol Tank Heater—a new water heater that is a real tribute to the ideals, traditions and accomplishments of The Cleveland Heater Co.

This new Rex-Patrol Water Heater is revolutionary as well as evolutionary in principle. It is an automatic or self-action tank water heater that may be attached to any range boiler. Thermostatic control and gas safety pilot are a part of the water heater—there are no accessories required to make this water heater entirely automatic.

The Rex-Patrol Tank Heater, of course, is approved by the Testing Laboratory of the American Gas Association and carries the Blue Star Seal.



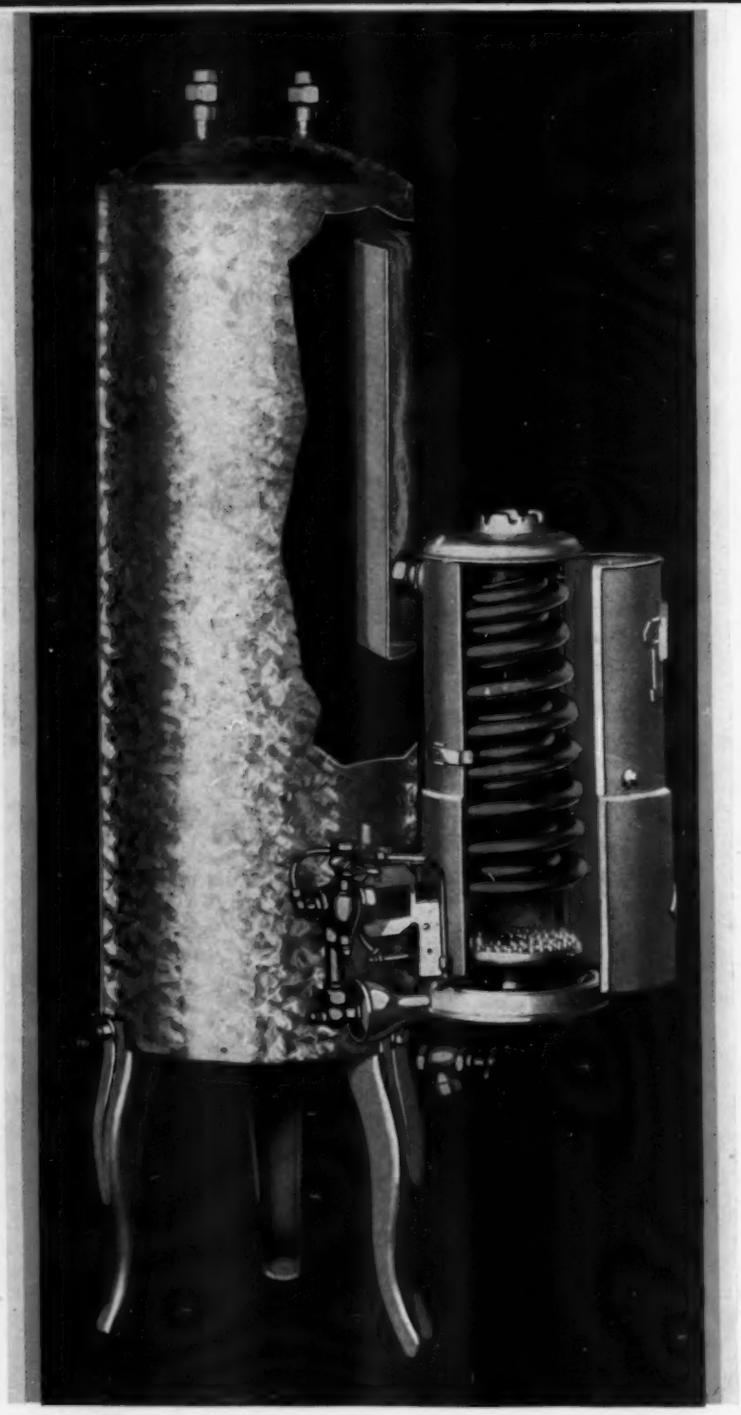
Patent Pending

Last but not least, Rex-Patrol Tank Heaters sell at the price within reach of everyone. Nor is that all—let us send you the *whole* story.

THE CLEVELAND HEATER CO.
1900 W. 112th St. Cleveland, Ohio

© The Cleveland Heater Co.

REVOLUTIONARY *and* SIMPLIFIED



The "Spee-Dee" Boiler

Trade Mark Registered
Patent Pending

SCIENTIFIC research was carried on for years in the laboratory of The Cleveland Heater Co. All efforts have been focused upon an attempt to reduce the cost of water heating. The result is the new Spee-Dee Boiler—the simplest and most economical range boiler that may be used as a hot water storage tank in conjunction with a Rex Water Heater.

With a Spee-Dee Boiler you can sell all your customers who want economical hot water service, but haven't felt they could afford to pay fancy gas bills. Also the hundreds of fairly wealthy families who will welcome the opportunity to get hot water service at reasonable monthly cost.

We want you to know more about Spee-Dee Boilers, how they reduce water heating cost, their principles of operation, and how they can help you increase your business.

Write for further particulars.

THE CLEVELAND HEATER Co.

1900 W. 112th St. **Cleveland, Ohio**

© The Cleveland Heater Co.

and barometer pressure the corrected rise in temperature is multiplied by the factor given for the pipette used. The results thus obtained are calories per cubic meter. Multiplying the calories per cubic meter with the factor .1048 which is the factor for converting calories per cubic m. gas saturated at 760 m.m. and 32° F. to B.t.u. per cubic foot gas corrected to 60° F. and 30″ M.

The apparatus is accurate to a very high degree if properly manipulated and can be used on almost any gas by simply changing the pipette.

It is convenient to carry and can be used at any point around the works or in the districts where some reason or other a heating value determination seems advantageous.

A sample of gas collected in an ordinary gas-sampling tube such as used for collecting samples for analysis is sufficient to run a number of tests by previously filling the measuring pipette with water instead of purging with a flow of gas.

Brief History of Carburetted Water Gas Process

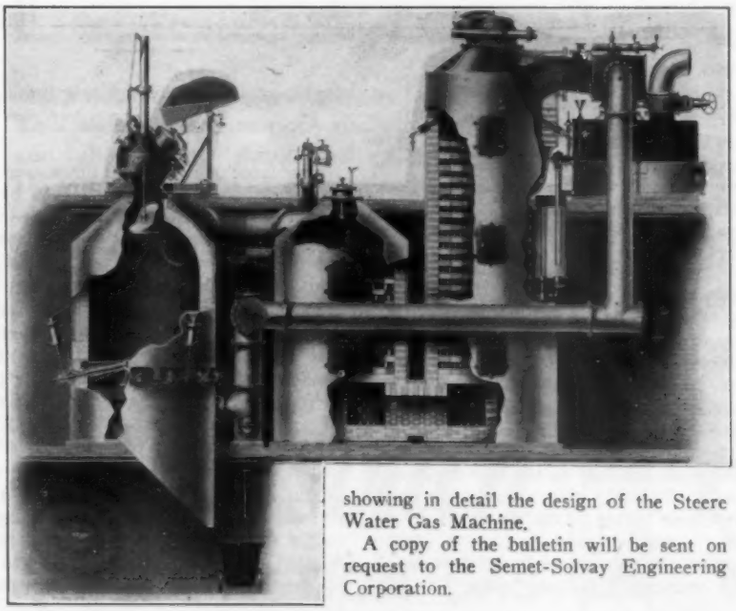
The progressive steps which have brought the carburetted water gas process to its efficient state as a source of economical large volume gas supply, are described in detail in a new bulletin just published by the Semet-Solvay Engineering Corp., 40 Rector Street, New York.

The bulletin, Number 43 of the company's series, entitled "Carburetted Water Gas," begins with a record of improvements made in the water gas process since 1921, when the backrun was introduced. The list includes the making of backrun gas, adoption of soft coal as generator fuel, elimination of hot valves, automatic fueling, continuous clinkering, utilizing of surplus heats to make process steam, absorption within the plant of effluent and drip and the method of enriching backrun gas to increase volume and reduce its specific gravity.

The chapter on Low Gravity Backrun Water Gas presents to the gas industry a complete story of this newest development. It describes the manner in which the backrun is employed to increase the volume of low gravity hydrogen gas in the finished product. In view of the attention that is being paid to the problem of mixing gases, the production of low gravity carburetted water gas becomes important and timely.

Another operating refinement of importance is presented in the chapter on absorption of effluent and drip oil within the water gas works. The bulletin describes how steam pollution can be avoided and economy increased by using waste liquors in making backrun gas.

The bulletin also tells how the safety factor has been increased on the modern water gas machine. The description of the Steere Three-Way Backrun Valve includes the arrangement whereby air is prevented from passing into the relief holder during the blast. A new control apparatus on the charging machine, to prevent leakage while fueling, is another contribution to safety that is presented, as well as illustrations of water gas plants and a drawing

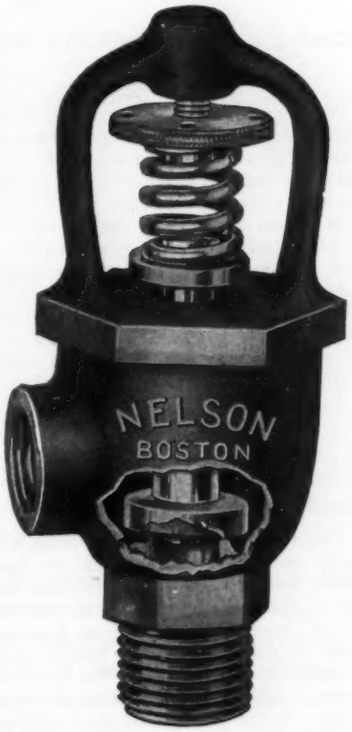


showing in detail the design of the Steere Water Gas Machine.

A copy of the bulletin will be sent on request to the Semet-Solvay Engineering Corporation.

Nelson Relief Valve

A product of special interest to gas companies is the "Nelson Relief Valve," which is designed for use on range boilers, storage systems, instantaneous gas water heaters, and for open and closed hot water house-heating systems and pumps.



As soon as the pressure becomes excessive, the valve, operating automatically, drains just the right amount of water to reduce the pressure to within proper bounds, and then automatically closes.

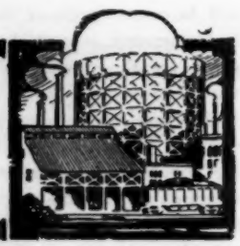
This valve can be adjusted in ten seconds to operate at any required pressure from 1 pound up to 175 pounds.

The external bronze tension spring does not come in contact with the water, neither is it affected by climatic or atmospheric conditions.

Other valves shown in the catalogue describing this device are the Diafram A.S.M.E. Std. relief valves, 2-way relief valves, 3-way relief valves, dual relief valves, Stack relief valves, steam water mixers and their complete line of gas water heaters. Several tables and specifications are included.

A copy will be mailed on request to Stack Heater Company, 250 Stuart St., Boston, Mass.

NEWS OF THE GAS INDUSTRY



Coming of Natural Gas Hailed with Glee

While many business men are enthused over the fact that natural gas from the Texas Panhandle will be served in Colorado this summer and thereafter, perhaps the mining executives are the most pleased. It is pointed out that this gas can be piped to places where it is not economical to haul coal, and with the wonderful heating units, smelters can be erected close to mines, the concentrates trucked to the railroad, and a big saving of freight rates, all of which means economy, with results that are worthwhile in the mining industry.

Sliding Scale for Cedar Falls

The Cedar Falls, Iowa, city council recently authorized purchase of the Iowa Public Service Company's distribution system in Cedar Falls, contract for delivery of gas by that corporation on a sliding scale basis and issuance of $60,000 bonds to apply on the purchase. The bond sale revenue will be augmented by a $30,000 balance in the consolidated fund sufficient to finance the deal and leave a fund for purchase of minor equipment. Three master meters will be placed at the gas holder in the city and a wholesale contract for three years will be negotiated on a basis of $1.50 a thousand for the first 5,000 feet; $1.40 up to 10,000 feet; to 65 cents for 500,000 to 1,000,000 feet. Voters by a 7 to 1 majority this spring authorized $125,000 bonds for establishment of a gas plant under municipal operation. Present requirements average about 5,000,000 cubic feet a month. Merchandise and fixture business of the Iowa Public Service Company is not included in the deal, but all other property, including some realty holdings, are involved.

Gets Huge Gas Well

The Ohio Oil Company in middle June brought in a gas well on the Wyoming side of the Hiawatha dome, south of Rock Springs, Wyoming, making about 50,000,000 cubic feet of gas daily. The well has been cemented, the flow held in restraint, subject to demand.

Norwood, Mass., Gas Co. Reduces Rates

As of May 1st the Norwood Gas Company put into effect the following rate schedule:

	Gross, Each	Disc.	Net
1st 100 cu. ft.....	$1.02	$.12	$.90
Next 200 cu. ft.....	.26	.02	.24
Next 200 cu. ft.....	.23	.02	.21
Next 1,500 cu. ft.....	.19	.02	.17
Next 13,000 cu. ft.....	.17	.02	.15
Next 65,000 cu. ft.....	.15½	.02	.13½
Next 100,000 cu. ft....	.12	.02	.10
Next 100,000 cu. ft....	.11½	.02	.09½
Next 100,000 cu. ft....	.11	.02	.09
Next 100,000 cu. ft....	.10½	.02	.08½
All over 480,000 cu. ft.	.10	.02	.08

Special water heater rate $1.70 per M. gross, $1.50 per M. net if paid within discount period. Minimum water heater rate $1.50 per month.

The new rate for space heating is as follows:

	Gross, Each	Disc.	Net
1st 100 cu. ft.....	$1.02	$.12	$.90
Next 200 cu. ft.....	.26	.02	.24
Next 200 cu. ft.....	.23	.02	.21
Next 1,500 cu. ft.....	.19	.02	.17
Next 3,000 cu. ft.....	.17	.02	.15
All over 5,000 cu. ft.....	11	.02	.09

Proposed Consolidation of Natural Gas Properties

Consolidation of approximately $800,000 worth of natural gas properties in Decatur County, Ind., is proposed in a petition filed with the Indiana public service commission by the Hoosier Gas and Light Company of Greensburg. Properties proposed to be bought and their respective purchase prices are: The Zoller Gas Company, $205,000; the Muddy Fork Gas Company, $149,000; the Sand Creek Gas and Oil Company, $97,000; the Citizens Gas Supply Company, $38,200; and the Hoosier Public Utilities Company, $308,000. A. E. Pierce is president of all the companies. In the petition the buying company proposes to pay half the price of each utility in shares of no par value common stock and half in ten-year 5 per cent bonds. To make this payment the company, now having 10,000 shares of no par value common, asked to issue a similar amount of common stock and $500,000 in first mortgage 5 per cent bonds.

Petitions to Extend Gas Mains into Mt. Kisco

The Westchester Lighting Company has filed a petition with the Public Service Commission for permission to extend its gas mains into the village of Mount Kisco, Westchester County. The board of trustees of that village granted a franchise to the company on June 4, 1928. The petition recites that the company "is now supplying electrical energy to the village and that it is therefore the logical company to also supply the village with gas."

Enormous Natural Gas Service

Figures of middle June give the open flow of natural gas from the wells of subsidiaries of the Cities Service Company at 2,383,848,000 cubic feet of natural gas daily. It serves a million customers and one hundred and thirty-five communities. To this must be added on or about July 1, Denver, Colorado, and various points along the three hundred and sixty-five-mile pipe line. This Denver-Amarillo line will get many cities where there never was any kind of gas service, and it will be the means of opening new smelters and various manufacturing plants in Texas, New Mexico and Colorado.

Newspaper Editors Visit California Gas Properties

Four large delegations of newspaper men covering the eight districts served by the Southern Counties Gas Company were guests of the company on trips of inspection to the Ventura oil and natural gas fields during the past month.

The purpose of the trips was to show the various newspaper representatives the vast natural gas resources of the newly developed Ventura fields and to give them "first hand" impressions of the large capital expenditures necessary to supply the 123,000 consumers of this gas utility with fuel.

This inspection tour created much interest and the four newspaper contingents visited the huge compressor station where millions of cubic feet of natural gas are compressed daily and conveyed through the

A "fair" example of Hotzone's new appeal to beauty

Sell the Hotzone Water Heater as an aid to beauty! Talk of frequent shampoos and midnight massages and velvet smooth skins. Tell of hot water as an aid to faces. This is Hotzone's modern appeal; and *—it puts an entirely new complexion on water heater selling.*

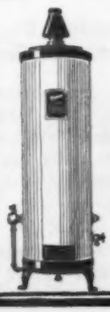
Why suggest sinks and scullery maids? Why stress the kitchen, the laundry or even the all-tiled bath? Old-fashioned coil heaters could serve those old-fashioned selling points plenty well enough.

***Beauty* demands instant hot water at any hour of the clock—a service which only a self-action heater can bring. And, the only Self-Action Heater which has been persistently stressing this important fact is the Welsbach Hotzone. Thus, those who sell Welsbach are a jump ahead at the very start.**

The attractive display shown above is a fair example of how forcefully the "beauty appeal" can be illustrated. This window display definitely establishes the Hotzone Water Heater as a beauty aid as well as a household necessity.

We have, in addition, prepared a series of striking newspaper advertisements along this same line. They bring Beauty to your aid in selling Welsbach Hotzones. Let us send you complete information regarding this 1928 model advertising and merchandising service. Address Welsbach Co., Gloucester City, N. J. *Offices in Principal Cities.*

Member American Gas Association

Welsbach  **HOTZONE**

SELF ACTION GAS WATER HEATER

company's 13-inch transmission line to Los Angeles and Southern California, a distance of more than seventy-five miles.

This mammoth plant contains 24 big Clark & Cooper compressor units and is one of the largest stations in the country. The beautiful new Ventura gas office building, recently completed, the company's new warehouse, garages and storerooms in this part of the system were also included in the itinerary.

The executives of the gas company were hosts at luncheon. F. S. Wade, president and general manager of the Southern Counties Gas Company and Frank H. Bivens, vice-president in charge of public relations and sales, gave brief talks of welcome to each group.

In outlining the gas company's definition of a public utility, Mr. Wade said: "A public utility is an agency created to serve the public with an every day necessity in a quantity adequate at all times for all reasonable requirements, of a quality as good as modern methods can produce and at a rate as low as possible commensurate with the cost of quantity and quality production. The service to be rendered by the company to the public to be delivered at all times with the courtesy which obtains in the personal dealings of one individual with another."

Accident Prevention Discussed by Paige At N. E. L. A. Convention

Leadership that inspires confidence, adequate wages and working conditions which provide the facilities and conveniences demanded by self-respecting workmen are the three requisities of the employer who would accomplish results in accident prevention work in his factory or shop," said Clifford E. Paige, vice-president of the Brooklyn Union Gas Company, in a paper read for him by F. C. Weber, assistant vice-president, before the recent convention of the National Electric Light Association at Atlantic City.

In a tribute to the National Safety Council, insurance companies and safety engineers, Mr. Paige declared that public and industrial sentiment looks with increasing favor on any activity which aims to insure health, safety and happiness for the workers.

Mr. Paige pointed to the fact that appropriations of money may accomplish much for the material side of accident prevention, but that only an executive who is a humanitarian can put soul into the enterprise.

After quoting from accident statistics, Mr. Paige continued:

"It is a melancholy fact that in some sections the work shows no progress, and, in fact, the situation seems to be growing worse. No matter what the figures may show in the way of accidents, no executive can afford to do less than his best to reduce hazards to a minimum.

"The public utility industry generally seems to be in the forefront of accident prevention activity, but success is not automatic and can come only from continued effort and stimulus. This is the opportunity for the executive. He has done so much by way of accomplishment in fields of enginering and finance that it should now be his obligation, and indeed his privilege, to make his industry thoroughly safe.

"The humanitarian," he said, "is the greatest executive, and the contented workman provides one of the nation's greatest assets.

To Get Their First Gas Service

Folks living in the Black Hills of Dakota, in and about Hot Springs and Belle Fourche, have never had any gas service, but the Black Hills Utilities Company has been organized by the Montana-Dakota Power Company for the purpose of constructing a gas pipe line from the gas fields near Baker, Montana, and serving the Black Hills with natural gas.

New Owners Want Natural Gas

Isaac S. Smith and associates of Cedar Rapids, Iowa, owners of the Iowa Railway and Light Company, who purchased the Sheridan Gas & Fuel Company of Sheridan, Wyoming, are planning to substitute natural gas for artificial gas, the natural gas to be piped from the Billy Creek field of Wyoming. If successful it means that its customers will be increased two fold, towns enroute being served. The line would come via Buffalo, Wyo.

Syracuse Lighting Co. Granted Permission to Extend Mains

Under an order recently made by the Public Service Commission, the Syracuse Lighting Company has been granted permission to extend its gas mains into the village of Liverpool, Onondaga County. This company has been furnishing electricity in the village for some time, but no gas has been supplied. About 550 service connections will be made.

Hope Engineering Company Gets Gas Franchise

The Hope Engineering and Supply Company, asking the city of Durango, Colo., for a twenty-five-year franchise to serve the city with natural gas, the election held June 12, won by a vote of 295 to 32. This gas must be piped from the Ute Dome in New Mexico, about thirty-five miles from Durango. The pipe line and the necessary accessories to complete the gas service will entail an expense of about $750,000. No date has been named as the probable time for the service to begin.

Second Well Brings Gas

The Ideal Cement Company of Denver, Colorado, drilling for natural gas on its property at Ada, Oklahoma, several months since, brought in a splendid oil well. A ready market is taking the oil. A second well—gas the objective—was ordered and in middle May a gasser making 5,500,000 cubic feet of wet gas, spraying about 100 barrels of oil daily, was uncovered. A third well is being drilled.

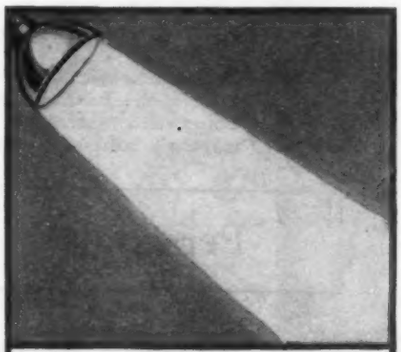
Gas Measuring Methods Investigated

H. S. Bean, of the U. S. Bureau of Standards, is assuming charge of the cooperative investigation on gas measuring instruments being conducted jointly by the Bureau of Standards, Bureau of Mines, and the Natural Gas Department of the American Gas Association. This work will be carried out in Buffalo with the active cooperation of the Iroquois Gas Company and will relate primarly to methods for measuring large volumes of gas under widely varying conditions.

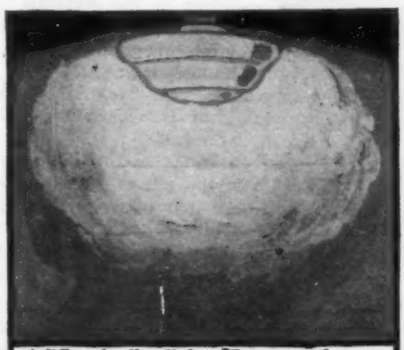
An Interesting Project

The development of a virgin territory in the heart of Pennsylvania has been undertaken by a new company founded for this purpose. Bellefonte, the geographical center of Pennsylvania, with a population of about 7,000, and State College, a population of 5,000, without counting the student body, are not supplied with gas at the present time. A total population of 15,000, including 3,000 in villages along the highway between both towns, is awaiting the completion of the new utility enterprise. Last fall leading citizens of this territory induced F. L. Murphy, gas engineer, who at that time was in charge of the Williamsport gas property, to prepare estimates for the development of this territory. Around the end of that year plans and drawings and cost computations were completed with the assistance of K. Mahnke, another former

No "Spotlight" or Scorched Air Heating with Clow Gasteam Radiators

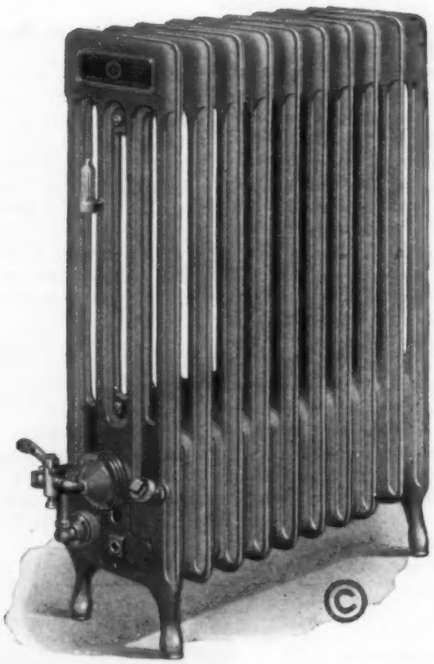


A spotlight. The way some heating fixtures operate. Fierce heat on spot. Cold areas elsewhere.



A diffused office light. Illustrates the way Clow Gasteam Radiators radiate heat. Rays are thrown to every part. All areas within a reasonable distance are equally heated.

The way Clow Gasteam Radiators give off heat. They don't hug heat to one small scorched area or throw it on one spot.



A SPOTLIGHT is all right for certain purposes. But you can't make a room comfortable with "spotlight" heating.

Another point: heating a small volume of air to very high temperatures—scorched air heating—results not only in very faulty heat distribution, but the quality of air in which human beings must live is greatly impaired.

There's no spotlight, or scorched air heating with Clow Gasteam. Clow Gasteam means *steam* heat, radiated in every direction—downward, upward and sideways. Clow Gasteam heats a very large volume of air to medium, healthful temperatures.

Heating with Gasteam Radiators doesn't result in frigid zones and torrid zones, both in the same room—at the same time. Floors as well as ceilings are warm—the farthest corner is as comfortably warm as next to the radiator—when rooms are heated with healthful, comfortable Clow Gasteam Radiators.

JAMES B. CLOW & SONS
201-299 North Talman Avenue, Chicago

CLOW GASTEAM

A. G. A. and Underwriters' Laboratories Approved

STOCKED IN EVERY SECTION OF THE COUNTRY

Williamsport engineer. Philadelphia bankers took over the financing, franchises were obtained and recently the Public Service Commission approved the charter of the "Central Pennsylvania Gas Company."

Construction of this property has begun under the direction of F. L. Murphy. His plans call for a carburetted watergas plant of sufficient capacity to take care of a rapid increase in the population, which might especially be expected from the college town, of industrial consumption and of the State Penitentiary, which lies between both towns. Special attention has been paid to house heating load. The design of the buildings will be such that the natural beauty of the valley, in which the plant will be erected, shall not be harmed. There will be no effluent from the plant, a point of great importance, as all waters in this territory are trout streams. A transmission line will convey the gas under high pressure to Bellefonte in the one and State College in the other direction, and supply intermediate points directly. For the first years it is intended to reduce the pressure at the ends of the transmission line and to serve the distribution systems with low pressure, but arrangements are made that in the future it will easily be possible to change over to high pressure distribution. The company expects to furnish gas before the end of the year.

Johns Hopkins Gas Engineering Graduates Locate in Attractive Positions

Johns Hopkins graduates have secured the following positions:

Mr. Louis W. Herbst, Jr., is a graduate in Gas Engineering at Johns Hopkins University in the Class of 1928, and has accepted a position as cadet engineer with the Western Gas Construction Company, Fort Wayne, Ind.

Mr. Frank J. Maguire, Jr., Gas Engineering, Johns Hopkins University, 1928, is among those enrolled in the cadet engineering course of the Consolidated Gas Company of New York.

Mr. L. G. Adams, of the Illinois Northern Utilities Company, has engaged Mr. Nathan Schofer, a graduate in Gas Engineering at Johns Hopkins University, 1928.

Mr. William P. Dittmar and Mr. Leonard A. Covell, who just received their degrees in Gas Engineering at Johns Hopkins University, have entered the service of the Seaboard By-Product Coke Company.

Mr. Raymond M. Finn, a graduate in Gas Engineering at Johns Hopkins University, 1928, has accepted a position with the Maryland Plant of the Bethlehem Steel Company.

Mr. Frank H. Dotterweich has accepted a position in the Gas Distribution Department of the Consolidated Gas Electric Light and Power Company of Baltimore. Mr. Dotterweich is a graduate of Johns Hopkins University, 1928, in Gas Engineering.

Denver Has Natural Gas

Natural gas from the Texas panhandle was turned into the pipes of the Public Service Company of Colorado at Denver, June 18, and it is expected that within a short time the entire city will be using natural gas.

On the eve of its arrival the newspapers carried a rotogravure section in which Henry L. Doherty, president of the Cities Service Company; W. A. Jones, first vice-president, and Clare N. Stannard, general manager of the Public Service Company of Colorado, were pictured and named as the men who piloted the deal from start to finish. Other pictures in the paper showed the various gas appliances in which natural gas would be found to be the best fuel, and there were included furnaces, hot water heaters, gas ranges and many types of heaters for the living room of the home.

Previous to the gas reaching any home the company presented a card of instruction:

"Every gas appliance in Denver must be adjusted or changed to use the new fuel. More than 300 gas service men have been especially trained to adjust gas burning equipment and gas appliances. One of these trained service men, carrying the proper credentials, will call to adjust your appliances within a few days.

"Until your gas appliances have been adjusted for natural gas, we suggest that you do not use your gas water heater, your gas room or fireplace heaters or the oven on your range.

"You may use the top burner on your gas range. Open the valve only part way as you light the burner. When the burner is lighted the flames should be about one inch high. Do not turn the valve wide open, as the natural gas will produce too high and too hot a flame.

"We regret any inconvenience to you during the change to natural gas. Your patience and co-operation during this period will aid materially and enable us to reach your home at the earliest possible moment."

Two Gas Engineering Graduates Make Olympic Lacrosse Team

Two of the members of the Olympic lacrosse team are graduates in Gas Engineering at John Hopkins University in 1928.

Mr. Raymond M. Finn is goal keeper and his excellent work in the preliminary competition did much toward giving the Johns Hopkins lacrosse team the right to compete in the Olympic games at Amsterdam. Finn is a graduate of the Baltimore Polytechnic and won on open competitive examination the scholarship of the Consolidated Gas, Electric Light and Power Company of Baltimore in 1924.

Mr. Frank H. Dotterweich, defense, is also a graduate of the Baltimore Polytechnic. Dotterweich shared in the Koppers Company scholarship last year.

Personals

P. S. Arkwright, president of the Georgia Power Company, was paid the highest honor in the power of the electric light and power companies of the country to bestow. He was unanimously elected president of the National Electric Light Association in the recent annual convention at Atlantic City, and took office immediately.

Tribute was paid Mr. Arkwright in the greeting of H. T. Sands, retiring president, who said:

"Your character and ability are assurance that the affairs of this association will be conducted with the highest executive ability. I wish and predict for you a most successful administration."

Merle Gustin, new local manager of the Central Indiana Gas Company at Elwood, Ind., has begun his duties, being transferred from Anderson. He succeeds Gus L. Knight, who has been manager for nine years and who was transferred to Muncie, Ind.

Charles H. M. Burnham, gas engineer of the Public Service Company, who joined the company about two years ago to take charge of the natural gas projects in northern Colorado and Cheyenne, Wyo., and now engaged on the Denver-Amarillo gas problems, has taken out a marriage license to wed Maude Plummer of Chicago.

Henry L. Doherty was honored on May 15th by about three thousand men and women, employees of the Public Service Company of Colorado, and their families, assembled in Denver, the date being the 58th anniversary of his birth. They sent him well wishes for the recovery of his health, Mr. Doherty being a patient at Battle Creek sanitarium, and announced to him that his dream was coming true: "Denver to be a smokeless city with gas as the principal fuel." The gas from Amarillo is expected to be in service on or about July 1.

Not Just Another Line!

The illustration here shows how appropriately the Homestead "Coalfire" fits in with the early New England setting. No other fire, except a Homestead "Woodfire," would be as attractive as well as utilitarian

Homestead Fires are not just another line of space heaters

These charming Coalfires and Woodfires are the only Truly Appropriate Fireplace Heaters because they present the appearance of open fires for use in open fireplaces. They do not over-lap into the field of space heaters for use anywhere and everywhere.

They are designed for one specific job. That is, to utilize gas in the fireplace in a way that produces clean, radiant heat and the appearance of an open fire.

Thirty-three (33) different Homestead Fires are available; every one definitely designed for Fireplace use only.

Not just another line, but a new line supplying the demand for the new, the artistic and the appropriate.

You need Homestead Fires if you are to do the volume of auxiliary heating business you should do this Fall.

Our new portfolio showing the complete line will be sent to New Business and Commercial Managers requesting same on their official stationery.

HOMESTEAD HEATER COMPANY, Inc.

Selvage Street and Fabyan Place WALTER KENNEDY, PRESIDENT **Newark, N. J., U. S. A.**

Obituary

Death of James M. Coles

Mr. James M. Coles, of Elizabeth, N. J., passed away on Friday, June 1, 1928, not having rallied from an appendicitis operation.

Mr. Coles was 58 years old and leaves a wife, son and daughter. He spent nearly his entire life in the gas and gas appliance business. For many years he was superintendent of the Consolidated Gas Co. of New Jersey at Asbury Park, N. J., and later was connected with the gas company at Hempstead, L. I. In 1907 he became connected with the General Gas Light Co. at 44 West Broadway, N. Y., in the capacity of manager of the City Lighting Department. Then later was made special representative and lighting expert for that company.

Mr. Coles was one of the best gas lighting engineers in the United States. He had entire charge of the lighting installation made in Madison Square Garden in New York in 1908, and also installations in Boston, Denver, Atlanta, Philadelphia and many other cities.

In recent years Mr. Coles has personally designed and installed the booth for the General Gas Lighting Company in nearly all of their large exhibitions throughout the country.

William H. Marshall Dies

William H. Marshall, vice-president and treasurer, Philadelphia Gas Works Company, who for more than forty-one years had been an important figure in the gas business in Philadelphia, died suddenly Monday evening, June 11, at his home, 1525 Diamond street. Death was due to heart disease.

Mr. Marshall was born in Philadelphia on March 18, 1864, where he attended public schools. After a brief employment in a brokerage house he entered the employ of the United Gas Improvement Company in May, 1887, in the accounting department. When the city leased the gas works to the United Gas Improvement Company in 1897, Mr. Marshall was made cashier of the Philadelphia Gas Works, and in 1909, in addition to that position, he was appointed assistant secretary of the U. G. I. Company. In April, 1912, he was appointed comptroller of the Philadelphia Gas Works and assistant to the third vice-president of the U. G. I. On January 1, 1928, when the new U. G. I. lease of the Philadelphia Gas Works became effective and the lease was assigned by U. G. I. to the Philadelphia Gas Works Company, Mr. Marshall was elected vice-president and treasurer of the latter company. He was the fourth oldest

William H. Marshall

employee in point of service of the United Gas Improvement Company.

He is survived by his widow and two sons, Samuel W., Norristown, Pa., and William H., Jr., Dayton, Ohio.

Trade News and Construction

United Engineers & Constructors, Inc., Activities

In order to increase the capacity and efficiency of the gas purification system at the Oelwein plant, the Central States Electric Company, Oelwein, Ia., has placed orders to furnish and install two 11 ft. 10 in. diameter U. G. I. circular steel purifiers, together with cover hoist and other appurtenances. In addition, there will be installed a welded steel seven-valve gas manifold to serve both purifiers.

The Lewisburg, Pa., Gas Company is making considerable gas main extensions to its system and there will be furnished and laid approximately 1,500 ft. of 6 in. and 3,800 ft. of 4 in. cast iron pipe, together with cross mains and services.

There are being installed 15 miles of gas mains for the Consumers Gas Company, Reading, Pa. These mains will connect the boroughs of Temple and Kutztown, Pa., and pass through Fleetwood and Lyons.

In addition to extensive work which is now being done for Combustion Engineering Corporation at Piscatawaytown, N. J., by the installation of a U. G. I. carburetted water gas plant, they have lately received an order to install two 7 ft. U. G. I. 4-pass High Duty Condensers. Each condenser will be capable of cooling 3,000,000 cu. ft. of gas per day from 300 degrees to 75 degrees F., when using not more than 532 gallons of 70 degree F. cooling water per minute.

There is being installed a centrifugal pumping system at the Chester, Pa., Coke Oven Plant to replace the present plunger type pumps. The centrifugal unit will deliver 1,500 gallons of water per minute and will be driven by a 60 h.p. motor. In addition there will be installed about 450 ft. of 15 in. welded steel piping and fittings, as well as the electric wiring and foundations.

The Connecticut Light & Power Company will have furnished and installed a new holder at the Norwalk plant. This holder will have a capacity of 1,500 M. cu. ft. Included in the work is the installation of the foundations as well as the connections and other auxiliary work required to make the installation complete.

The Peoples Gas Company, Glassboro, N. J., is preparing to make improvements to its manufacturing equipment by the addition of a 9-foot U. G. I. cone top generator to a present 8-foot 6-inch set. The new generator will be equipped with Bernitz linings and other parts in order to bring the apparatus up to present day standards.

Springfield Places Order for Ammonia Concentrator

The Springfield Gas Light Co., Springfield, Mass., have placed a contract with John H. Unger, Chicago, Ill., for a 54-inch ammonia concentrator for producing a high percentage gas liquor concentrate, lighter than water, that will command a much better price than the ordinary concentrate. The present 48-inch still will be utilized as a preheater for driving out most of the impurities in the liquor before it enters the still proper. By a special arrangement for scrubbing the vapors with a heavy oil, it is expected that the concentrate will become colorless. The lime will be fed into the still without the addition of water, thereby causing a saving in steam and lime and keeping the still cleaner for a longer period of time than usually is the case. The hoods are all removable through the cleaning openings in the still sections.

KNOWN FACTORS IN METER VALUE

THE EQUITABLE TRUST COMPANY OF NEW YORK
11 Broad Street
Member of the Federal Reserve System

New York May 15, 1928.

Mr. Wm. E. Helme, Treasurer,
American Meter Company,
700 Bulletin Building,
Philadelphia, Pa.

Dear Mr. Helme:

As today marks the sixty fifth anniversary of the opening of your account with the Importers & Traders, we take this opportunity of extending to you our best wishes and expressing our appreciation of your continued confidence and good will.

It is our earnest desire at all times to give our best attention to any business you may entrust to us and we hope whenever you can use our services in any way that you will give us the pleasure of serving you.

With renewed assurance of our esteem, we remain

Yours very truly,

H.H. Powell
Vice President.

HHP/ATD

In the Light of Manufacturing Stability

The letter reproduced above bears witness to 65 years of unimpaired credit reputation—a gracious tribute to a signal record of manufacturing stability.

We publish this letter because the lion's share of praise belongs to the customers of American Meter Company. By their constant support of quality and other known factors in meter value, they have made possible American Meter Company's responsible leadership in Gas Measurement Engineering.

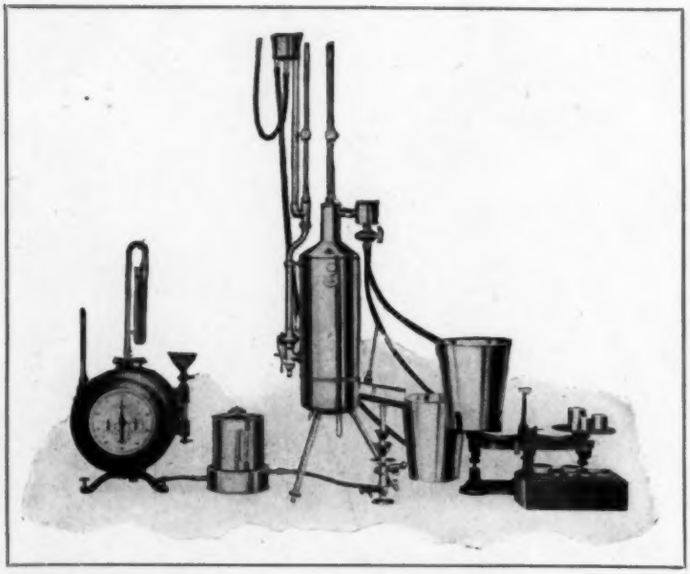
AMERICAN METER COMPANY

INCORPORATED

The World's Largest Manufacturers of Gas Meters and Allied Apparatus

Established 1836

Quality~
A code of Manufacturing practice ~as real today as when D&H McDonald opened shop and began to serve the gas industry



Standards of Measurement ~a Basis of Justice

American Meter Company has directed incessant efforts—supported by constant research and long experience—to the maintenance of enduring standards of measurement.

The result of these efforts is exemplified, first—in the apparatus manufactured by D. McDonald & Company for laboratory and experimental purposes, and second—in the meters we make for practical every day use.

The apparatus safeguards the measured foot as a basis of justice, and sets recognized standards for qualitative or quantitative ascertainment.

The meters obtain accurate registration of gas used on behalf of consumer and Gas Company alike.

Thus, apparatus and meters combined establish sound values that build harmony, profit and better public relations.

D. McDONALD & COMPANY

Specialists in Gas Meters and Allied Apparatus for Customer Requirements

Albany, N. Y.

Established 1855

Samuel Hill achieved the first American Gas Meter in Baltimore in 1832. The record since is noteworthy for constant and progressive development in gas measurement engineering.

Performance in Service Confirms Their Value

Maryland Meter Assets insured by

Wide Facilities
Best Quality Material
Experienced Labor
Thorough Inspection in every stage of manufacture.

Known Factors in Accurate and Productive Meter Service

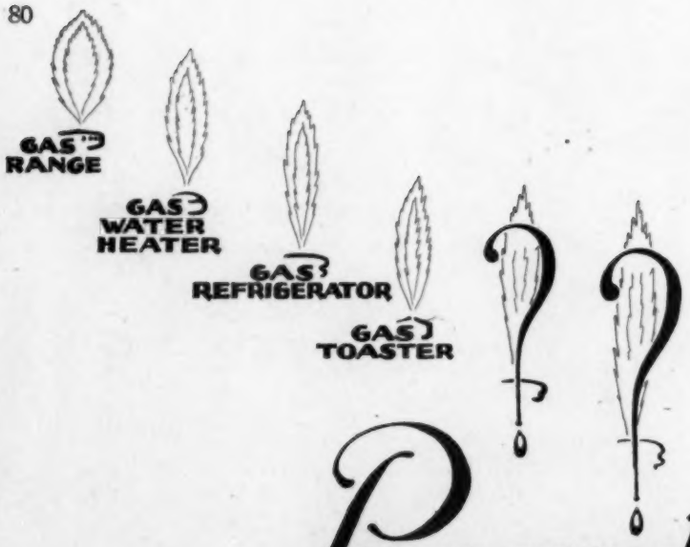
1—Adjustable Tangents.
2—Double Acting Clicks.
3—Channels and Valve Port Construction.
4—Clearance between Diaphragms and Casing.
5—Bottom—Solid—Leak Proof.
6—Top Cover and Flange Construction.
7—Bridge Plate and Carriage Design and Construction.
8—Durability of Valve Seat and Valve Cover.
9—Diaphragms—exclusive American Meter Company quality, fabrication methods and impregnation formulas.
10—Casing constructed of finest quality Tinned Steel manufactured to specification.

MARYLAND METER WORKS

Specialists in Gas Meters and Allied Apparatus for Customer Requirements

Baltimore, Maryland

Established 1866



Preparedness for Fluctuating and Growing Capacity Demand

CONSUMERS' GAS METERS
Tinned Steel Case

Model	Model
5—175A	5—150B
10—375A	10—300B
30—875A	20—450B
60—1500A	30—600B
150—3400A	60—1300B
	100—1800B

THE MODEL NUMBER DENOTES (1) LIGHT. (2) CAPACITY CU. FT. PER HR. ½ IN. LOSS. (3) TYPE OF METER.

The greater and more varied use of Gas Appliances has created an economic need for adequate meter installations to register increased capacity demand.

The A type meter—without change in the standard dimension from center to center of side pipes—offers latent capacity for growth in consumer gas utilization. It has thus solved for many of our customers a specific problem in meter investment.

Helme & McIlhenny quality A type and B type meters afford a capacity range from 150 to 3400 cubic feet per hour. Growing capacity demand can, therefore, be adequately provided for by the meter which best suits the requirements. Our meters consistently embody all the refinements and improvements that are Known Factors in Meter Value.

ESTAB. 1848
H & McI

HELME & McILHENNY

Seventeenth and Clearfield Streets

Philadelphia, Pa.

Established 1848

AMERICAN METER COMPANY
Incorporated

Cliff Joins MacGregor Valve Company

J. W. Cliff has recently joined the MacGregor Valve Company in St. Louis as production manager. Mr. Cliff has had wide experience, holding important executive and engineering positions with such firms as the Power Accounting Company, Hyatt Roller Bearing Co., Wright-Martin Aircraft Co., Lehigh Accounting Co., Weston Instrument Co., and for the last five years shop superintendent manufacturing Merco-Nordstrom Valves. Under his jurisdiction the MacGregor Valve Co. is having machines installed for quantity production of MacGregor Rotary Valves—the latest development in the lubricated valve field.

Naylor Changes Company Name

With the announcement of the completion of their new plant and the increase of their facilities some 200 per cent, the company formerly known as the Naylor Spiral Pipe Company also announces the change in name to the Naylor Pipe Company.

The new product of this organization, Spiralweld Toncan Iron Pipe, has necessitated the increased facilities, as well as the change in company name.

There will be no change in management, all officers and executives carrying on in their present positions.

Kennedy Company Appointed American Agents

The Herbert Kennedy Co. has been appointed agents in the United States for Societe Anonyme des Hauts-Fourneaux et Fonderies de Pont-a-Mousson, the producers of Pont-a-Mousson Cast Iron Pipe and allied products.

American Stove Co. Names Head for New Department

A number of promotions have been made by the American Stove Company at its Cleveland plants incidental to the opening of a new department for the handling of oil and gasoline stoves.

Thomas Sourbeck, who has been with the company 35 years and who for several years was sales manager of the New Process division, has been made general manager of the new division. His headquarters will remain at the New Process Stove Company on Perkins avenue N.E. B. R. Tritton, credit manager, has been advanced to sales manager to succeed Sourbeck, and A. G. Brechtl has been made credit manager.

Another change just announced is the appointment of Edward T. Butler, formerly sales manager at the Dangler Stove Company, to the position of assistant manager at the Dangler division. Butler has been with the company 40 years.

Grady Elected Director and Treasurer of Superior Meter Company

At a meeting of the board of directors of the Superior Meter Company held on June 26, Mr. Jay M. Grady was elected as director and treasurer of this company.

Notice is also given that on June 22 Mr. C. T. Howe resigned as director and treasurer, and from said date has no further connection with the company in any capacity.

Gas Machinery Co. to Erect Water Gas and Other Equipment at Columbus

Contract has been awarded for furnishing and erection of a six-foot water gas equipment and purifying equipment, which will be erected in the gas plant at Columbus, Ga.

The new water gas set will be placed alongside of the Gas Machinery Company's six-foot set installed in Columbus several years ago, and the Gas Company is furnishing new building addition and foundations to provide for the new equipment, which will enable the Gas Company to furnish increased capacity.

The contract has been awarded for six-foot carburetted water gas apparatus complete with auxiliary equipment, cooling scrubber, tar washer and purifying equipment to be installed in the new gas plant now being erected at Fort Lauderdale, Fla.

The Gas Company is installing mains and other auxiliary equipment required for the completion of the plant, and the gas will be turned on in Fort Lauderdale at an early date.

Western Gas Construction Company Receives Contracts for Work in South Dakota

The Northwestern Public Service Company of Huron, South Dakota, has placed contracts for its following plants:

Huron, S. D.—Two 11 ft. by 11 ft. by 19 ft. high purifiers, complete with 10 in. bypass, one 5 ft. 6 in. by 19 ft. high Duty condenser, 12 in. hot line from present water gas machines to the outlet of the present condenser, complete with bypasses, new holder bypass and one 10 ft. diameter by 70 ft. long high pressure storage tank.

Aberdeen, S. D.—One 6 ft. by 5 ft. by 5 ft. Western water gas machine, complete with hydraulic cylinders and hand control, blast header and blower, necessary steel operating floor; one 5 ft. 6 in. by 25 ft. high Duty condenser complete with 16 in. bypass and necessary fittings to connect to their present relief holder.

Mitchell, S. D.—One 5 ft. by 4 ft. by 4 ft. Western water gas machine, complete with blower and blast piping; No. 1 Roots' meter with bypass; two 11 ft. by 11 ft. by 10 ft. purifiers complete with trays, side doors, cover hoists and 10 in. circle series connections; one 4 ft. 6 in. by 25 ft. high Duty condenser; hot line from set to relief holder; new bypass for shaving scrubber and the necessary overhead steel piping from the purifiers to compressor room.

Semet-Solvay Engineering Corporation to Build Condenser for Wisconsin Gas and Electric Company—Other Contracts Received

Semet-Solvay Engineering Corporation is building a four-pass tubular condenser for the Racine (Wis.) Gas and Electric Company. It will have a capacity for cooling 2,500,000 cubic feet of gas in 24 hours. The condenser will be entirely of arc welded construction with reinforced corners and I-beams to strengthen the bottom water compartment. A by-pass of 20-inch double arc welded Steere steel pipe, with three Steere valves, will also be installed.

The Citizens Gas, Electric & Power Company, Nantucket, Mass., has placed an order for a Steere welded steel purifier. This purifier will be a duplicate of one recently installed and will be 14 feet in diameter. Work is to be rushed in order that the installation will be complete when the company encounters its heavy summer demand.

The Central States Utilities Company has ordered a Doherty washer cooler for its Grand Haven, Mich., plant. The cooler will be 3 ft. by 41 ft. and will contain 30 feet of grids.

An order for new blast piping and a quantity of pipe, fittings and valves has been received for the plant of the Fort Madison (Ia.) Gas Light Company.

The Southern Indiana Gas and Electric Company, Evansville, has placed an order for a Steere Water Gas Machine with Backrun. It will be 10 ft. by 10 ft. by 10 ft. in size.

The generator will be of the flat bottom type and will contain four observation holes. It will be equipped with Steere rolling grates for continuous clinkering.

The superheater will contain sprays to be used for making backrun process steam from water or plant effluent, or for making low gravity backrun gas for peak loads.

E. L. Phillips & Company of New York, engineers, have ordered a quantity of Steere welded steel pipe and fittings for installation at Garden City, L. I. The pipe will be 20-inch and 24-inch in size and will be fitted with Van Stone joints. All pipe will be tested for tightness under 25 lbs. of air pressure and will also be submitted to a hammer and drop test.

The Hagerstown (Md.) Light and Heat Company has ordered a 400-gallon capacity R. S. De-Emulsifier for the treatment of water gas tar emulsions.

The Wisconsin Hydro-Electric Company, Monroe, has purchased a 4 ft. 6 in. Steere water gas machine. The construction work will include the rebuilding of the operating floor and a quantity of plant piping in various sizes.

The Providence (R. I.) Gas Company has ordered 10 stacks of Steere cooling coils. The tubing in these stacks will be made of admiralty metal, each tube 20 feet long and each stack 36 pipes high. They will be used with a Steere-built Doherty washer cooler and will enable the plant to cool and condense up to 8,000,000 cubic feet of gas daily.

The Big Rapids (Mich.) Gas Company has purchased a multiple washer. The Big Rapids installation will have a capacity for cleaning 250,000 cubic feet of gas in 24 hours.

The Dixie Construction Company, Montgomery, Ala., has ordered a Doherty Washer Cooler to be installed at the gas plant in this city. The cooler will be three feet in diameter by 46 ft. 8 in. high. It will contain 30 feet of scrubber grids and will have a capacity sufficient to cool 1,000,000 cubic feet of gas in 24 hours. The cooling towers will be of welded steel construction.

The Nassau & Suffolk Light Company, Hempstead, L. I., has ordered a 1,400-gallon capacity R. S. De-Emulsifier.

The Northampton (Mass.) Gas Light Company is installing a 1,400-gallon capacity R. S. De-Emulsifier.

The New York State Gas and Electric Corporation, Ithaca, N. Y., has purchased a 400-gallon R. S. De-Emulsifier unit.

There is being built a Steere Water Gas Machine for the Brookfield (Mo.) Gas, Electric and Heating Company. The machine is 4 ft. 6 in. by 4 ft. by 4 ft. in size and will be operated with soft coal as generator fuel.

There is being installed new cooling, condensing and purifying equipment for the Central States Utilities Company's plant in Monroe, Mich.

The equipment consists of a scrubber and a Steere welded steel purifier. The scrubber will be 3 feet in diameter and 41 feet high.

The purifier will be of the two-compartment type, 10 ft. by 33 ft. by 12 ft. 6 in. in size. It will have a 12-inch manifold with six Steere valves. All equipment and piping will be of standard Steere welded construction.

The Queens Borough Gas and Electric Company, Rockaway Park, L. I., has purchased a large quantity of Steere welded steel pipe for its plant here. The pipe is fitted with Steere sleeve and Van Stone joints and varies in sizes between 20 and 36 inches. It will be used throughout the plant in connection with the installation of new water gas equipment.

The Semet-Solvay Engineering Corporation is furnishing material for the gas plants of the Consumers Power Company, Flint, Mich. Two ventilator bases have been ordered for installation at the Court Street station. They are being fitted with a catch ring, welded on to prevent dripping of condensate.

The second order received was for Steere welded steel pipe, 30 inches in diameter and fitted with sleeve joints, for the blast system at the East Street plant. This was a rush shipment and was fabricated and delivered by motor truck from the company's shops at Owosso, Michigan, four days after the order was received.

Howe Leaves Superior Meter Co.

Charles T. Howe, treasurer and manager of Superior Meter Co., has disposed of his entire interest in that company and has withdrawn as of July 1.

"Lux" Reaches Half Century Mark

The Alpha-Lux Co., Inc., New York City, announces that "Lux," discovered in 1878, is now 50 years old.

Joseph Dixon Crucible Co. Has New Chicago Sales Office

Our readers in the Chicago district should make a note of the new address of the Chicago sales office of the Joseph Dixon Crucible Company, which is now located at 2003 Builders' Building, which is situated on beautiful Wacker drive and LaSalle street, Chicago.

Offices Removed to New Factory

The North American Mfg. Co. of Cleveland, Ohio, announces the removal of their office to their new factory, now located at 2906 E. 75th street, Cleveland, Ohio.

This firm manufacturs a line of floors for industrial uses.

Waring Changes Business Address

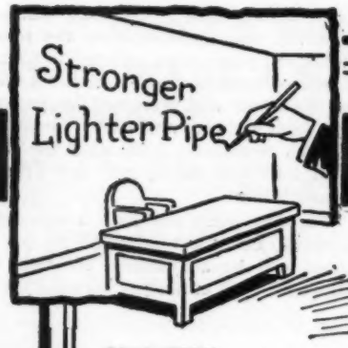
George H. Waring, consulting gas engineer, has changed his office in Grand Rapids from the Powers Theatre building to 624 Grand Rapids National Bank building, as of June 1.

Steere to Lecture at U. of P.

Frank W. Steere, vice-president of the Semet-Solvay Engineering Corporation of New York, will again deliver a lecture in the Fuel Engineering course which will be offered next fall by the Towne Scientific School of the University of Pennsylvania. Mr. Steere's subject will be, "Condensing and Scrubbing of Gas," and will be presented in a series of talks on the Manufacture of Special Fuels. Mr. Steere addressed the students of the Towne school on the same subject last April.

Kitson Company Changes Philadelphia Address

The Kitson Company announce the removal of their offices, effective June 1, to 261 North Broad street, Philadelphia, Pa.



McWane Cast Iron Pipe

The Hand-Writing On The Wall.

CONSUMPTION of modern type cast iron pipe (stronger but lighter) for over a year now has exceeded the use of old style heavy pipe.

McWane pipe is the only modern improved type in 16 foot lengths that is moulded *horizontally* in *green sand*, both "inside and outside" --- with molten iron flowing *inches* instead of *feet*.*

Illustration of McWane Screw - Joint Gas Pipe ready to screw together. This joint is leak proof, and exhaustive tests have proved it even stronger than the pipe itself, because there is extra metal where the threads are cut.

McWANE PIPE CUTS WELL, TAPS WELL AND SHIPS WELL.

** The shorter distance iron flows, the stronger and sounder the casting. Nature penalizes long distance casting.*

WRITE FOR ILLUSTRATED LITERATURE

McWANE CAST IRON PIPE CO. BIRMINGHAM, ALA.

PACIFIC STATES CAST IRON PIPE CO. PROVO, UTAH

SALES OFFICES IN PRINCIPAL CITIES

McWANE
CAST IRON PIPE

Ingersoll-Rand Opens New Branch in St. Louis

It is announced that the Ingersoll-Rand Drill Company, with offices at 314 N. Broadway, St. Louis, Mo., will be succeeded by Ingersoll-Rand, Inc., on May 1, 1928.

A new branch operating under the St. Louis office has just been opened at 226 West A Street, Picher, Okla.

It is felt that by establishing this new office the company will be in a better position to serve its customers in northern Oklahoma, southern Missouri and Arkansas.

Gas Company Installing Distributor

The Bement Gas Company, which supplies gas to Petersburg, Ind., is installing a gas distributor. The company gets its supply of gas from natural gas wells west and south of Petersburg, but the distribution from the wells has not been regular.

H. D. Savage New President Combustion Engineering Corporation

George E. Learnard, president of International Combustion Engineering Corporation, 200 Madison Avenue, New York, announces the resignation of Joseph V. Santry as president of Combustion Engineering Corporation, an American subsidiary of International Combustion Engineering Corporation, and the election of H. D. Savage, for many years vice-president, as president to succeed Mr. Santry.

George T. Ladd has been elected vice-chairman of the board of directors of Combustion Engineering Corporation.

In addition to the presidency of Combustion Engineering Corporation, Mr. Savage holds the following offices in subsidiary companies of International Combustion Engineering Corporation: President Dry Quenching Equipment Corporation; president Combustion Engineering Corporation, Ltd., of Canada; vice-president Ladd Water Tube Boiler Company, and vice-president Raymond Brothers Impact Pulverizing Company. Mr. Savage is a member of the American Society of Mechanical Engineers, American Society of Mining and Metallurgical Engineers, Franklin Institute, and is the author of numerous papers and technical articles.

Former Cast Iron Pipe Man Enters Advertising Field

Cox & Silver, Inc., Advertising Counsellors, American Trust Bldg., Birmingham, Alabama, has been incorporated by Oliver Cox and Ralph Silver, taking over May 1 the business of the Cox Advertising Agency of the same city.

Mr. Cox has operated this business for the last ten years as the Cox Advertising Agency. Mr. Silver for the past twelve years has been advertising manager of the American Cast Iron Pipe Company of Birmingham.

The firm will act as general advertising and sales promotion counsellors, special attention to be given to industrial accounts.

Consolidation Coal Co. Issues Printed Statement of Policy to Fellow Coal Producers

The Consolidation Coal Company has recently distributed a printed statement which is of special interest to producers of coal for industrial use and industry in general.

This statement, which appears over the name of their president, G. J. Anderson, goes on to say, in part, that they do not believe that the "present plight of the bituminous coal industry will be remedied by forcing unwanted coal upon an unwilling market." It further indicates that no relief is to be gotten by price cutting below an unprofitable level. Proper wage scales are advocated and wage lowering condemned.

In order to arrive at a proper constructive basis this company is closing for an indefinite period some of its least efficient mines with the idea that "the greater concentration will yield benefits to the labor remaining and the company as a whole."

The company also bespeaks consideration for any of its former employees who might be seeking employment elsewhere in the industry, feeling that such experience and ability should not be lost.

The company "believes each and every producing unit must make some sacrifice," to the end that the industry might make quick progress toward its rightful economic recovery.

Work on New Rockford Gas Plant to Start

Work upon the $1,500,000 coke oven and gas plant which the Central Public Service Company will establish in Rockford, Ill., will begin shortly, D. C. McClure, vice-president of the company which controls the Rockford Gas, Light and Coke Company, announced. The new plant will occupy part of the site already owned by the company and the three-acre tract recently acquired from the Chicago, Milwaukee & St. Paul. The Koppers Construction Co. of Cleveland has contract for the plant. A new by-products industry will be incorporated in the plant, producing ammonia and tar, raw material from the present Rockford plant being shipped to Chicago for by-products manufacture. Linking of Rockford and Freeport by gas pipe line will not be undertaken until next Spring, or possibly 1930, when the Rockford unit will supply gas for Freeport consumption.

The new plant will have a capacity of 3,500,000 cubic feet daily and the present plant will be abandoned, the new unit supplanting it entirely.

Welsbach Street Lighting Co. Removes Offices

Welsbach Street Lighting Company of America announce the removal of their offices to 261 North Broad street, Philadelphia, Pa. Their former address was 2000 Arch street, Philadelphia, Pa.

Beach Resigns

Brewster S. Beach, sales and advertising manager of the American Gas Products Corporation, New York, distributor of Ideal Gas Boilers, has recently resigned his position with that company.

Appliance Company Chartered

Guenther Mfg. Co., Inc., Buffalo, N. Y., manufacturing gas burning radiators, apparatus, etc., has been chartered at Albany with $150,000 capital. George A. Guenther, 1281 Jefferson street; Theodore Guenther, 19 Landon street, and Edwin Guenther, 1285 Jefferson street, Buffalo, N. Y., are directors and subscribers.

Cleary Appointed General Sales Manager

The appointment of James Cleary as general sales manager of Combustion Engineering Corporation will be of interest to a great many men in the power plant field. Mr. Cleary is one of the best known men in this field, having engaged in engineering and sales work for over twenty-five years.

Mr. Cleary has been connected with various plants in the West and with the Public Service Gas and Electric Company of New Jersey. Since associating himself with Combustion Engineering Corporation, in 1921, Mr. Cleary has been district manager of the Philadelphia and Detroit offices, and for the past two years assistant general sales manager.

WOULD YOU DO IT IF YOU WERE A MILL DESIGNER? DO WHAT?

Give the man who has steam an elevator that may some day burn his plant down or otherwise cause him great loss **When You Do Not Have To.**

You know, if you know anything, that the great racing spectacle that is now on is

INSURANCE RATES KEEPING UP WITH FIRE LOSSES!

Every day the papers record "mysterious fires."

Electricity is being discovered as the Great Incendiary.

The Best Architects in the land are giving their clients who have steam Ridgway Elevators and thus avoid the Fire Hazard.

The Greatest Concerns all over the land have gotten and are getting Ridgway Elevators because they are far and away the finest things in the way of elevators ever produced.

Here is a sample of the thousands. 3 times 7 = 21 for luck.

United Gas Imp. Co.	H. J. Heinz Co. "57"	Crane & Co. (Dalton)
Yale & Towne Mfg. Co.	International Harvester Co.	United States Government
Cluett, Peabody & Co.	John Wanamaker	E. I. Du Pont & Co.
Consolidated Gas Co.	Remington Typewriter Co.	General Electric Co.
National Cash Register Co.	Continental Gin Co.	Packard Motor Car Co.
Hammermill Paper Co.	Erie Railroad Co.	Continental Can Co.
Procter & Gamble Co.		American Tobacco Co.
		John Morrell & Co.

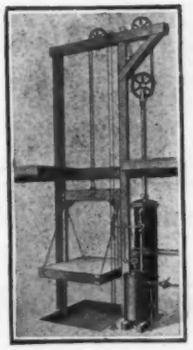
These are the money makers and are run by men of Ability. That is why they

"HOOK 'ER TO THE BILER"

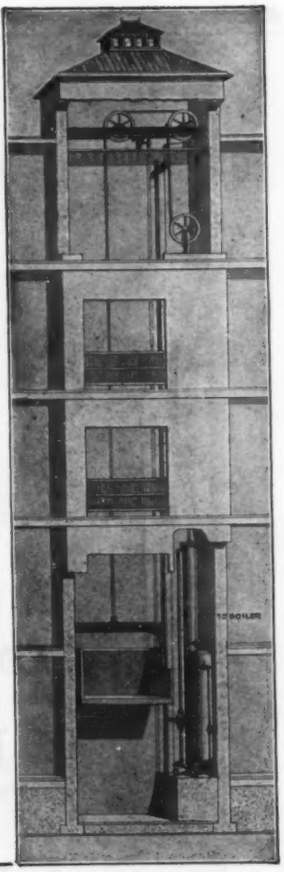
CRAIG RIDGWAY & SON CO.

Over 3,000 *in daily use.* COATESVILLE, PA.

Direct Acting

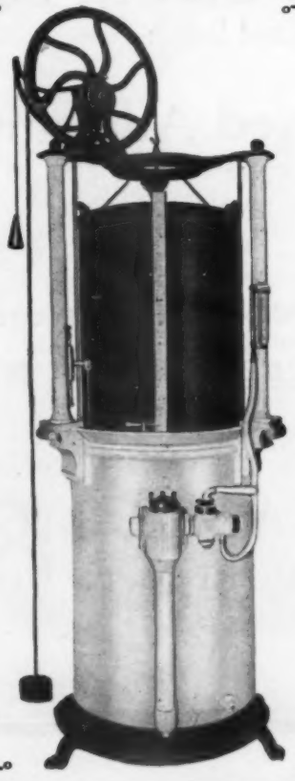


Double Geared



SUPERIOR

Gas Meters
Provers
Service
Cleaners
Diaphragms



SUPERIOR METER CO.
167 - 41st Street
Brooklyn, N. Y.

Six Major Improvements

1 Sprague Special Diaphragms
Acid resisting, mineral retanned leather

2 Enclosed Top Bracket
Protects and lubricates the worm and gear

3 Improved Valve Cover
Eliminates possible breakage in transit

4 Raised Bosses on Flanges
Eliminates seepage in wet gases

5 Bronze Bushed Links
Reduce wear and lost motion

6 Improved Adjusting Tools
Reduce shop costs

All designed to better the one and a half million Sprague Meters in service

THE SPRAGUE METER CO.
BRIDGEPORT, CONN.

Amarillo-Denver Gas Line

ANOTHER link in the network of great pipe lines which spread across the continent—the main line of this latest engineering conquest when completed will contain over 300 miles of 20 and 22-inch "NATIONAL" Pipe — The Recognized Standard for Gas Line Service.

NATIONAL TUBE COMPANY

Frick Building, Pittsburgh, Pa.

Pioneers in Pipe Progress

THOUGH the trails of the Forty-Niners are cold.....though their glamorous deeds survive alone in song and story..... pioneers are not yet done in America!

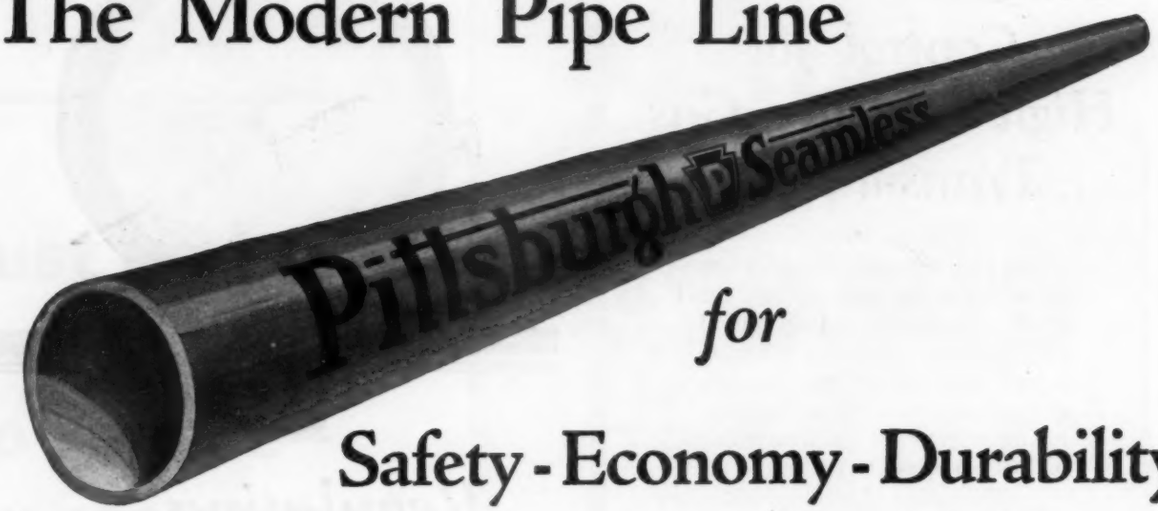
Acipco engineers are pioneers. In the photograph shown here you see the first 16-foot bell-and-spigot cast iron pipe made in America. Acipco engineers created it to speed up and lower the cost of pipe line construction.

Since the introduction of our Mono-cast centrifugal pipe—also made in 16-foot lengths—more than 5,500,000 feet have been put into service!

Specify Mono-cast centrifugal cast iron pipe in your system. You will find complete Mono-cast standard stocks in these cities: New York City, Chicago, Minneapolis, Kansas City, Dallas, Los Angeles, Seattle and San Francisco.

AMERICAN CAST IRON PIPE COMPANY
BIRMINGHAM, ALABAMA
DISTRICT OFFICES IN PRINCIPAL CITIES

The Modern Pipe Line



for

Safety - Economy - Durability

The Advantages of Pittsburgh Seamless Line Pipe Include:

1. **Longer lengths (up to 45 feet).**
2. **Various Carbon Content (.10 to .20; .30 to .40; .40 to .50).**
3. **Thorough, minute inspection.**
4. **Fewer joints--lower installation cost.**
5. **Economy in maintenance of line.**
6. **Finest open hearth steel--less corrosion.**

Pittsburgh Steel Products Co.
DIVISION OF
Pittsburgh Steel Co.

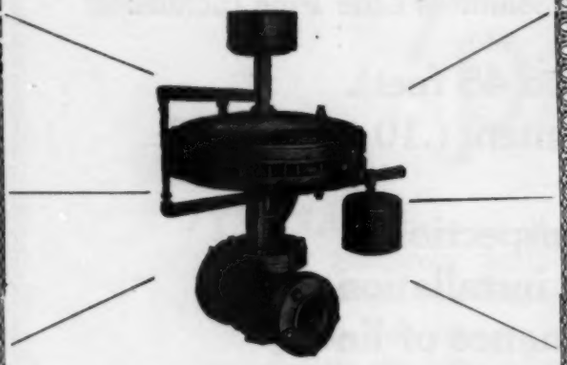
PITTSBURGH · NEW YORK · DETROIT · CHICAGO · HOUSTON · TULSA

For Line Pipe, Casing, Drill Pipe, Oil Well Tubing, use

Unusually Sensitive Control for High Pressure Gas Transmission

The Fulton Duplex Sensitive Gas Governor is designed to meet the needs of manufactured or natural gas companies who desire to control a high and varying inlet pressure and reduce it to a low and unvarying outlet pressure for illuminating or fuel purposes.

The power to operate this governor is derived from two dia-



phragms of equal area, moving in opposite directions, but transmitting their power in the same direction. This gives a vast increase in sensitiveness and power over that possessed by a governor with a single diaphragm.

The governor is easily and quickly installed, and, due to the simplicity of its construction, requires but little attention afterward.

Catalogue on request

Chaplin-Fulton Mfg. Co.
28-40 Penn Ave., Pittsburgh, Pa.

Regulating Steam Pressure to the Producer . . . . .

In the producer, steam is forced through the active fuel bed, where it decomposes, freeing gases of high heating value. It is highly essential that this supply of steam be kept steady and uniform.

With a Bristol's Recording Pressure Gauge jotting down the inlet steam pressures, it's a simple matter for the operator to regulate them accurately, according to the information on the dial, so that the producer gets the necessary steady steam supply . . . and so that there will be no damage to the grates from overheating.

The simple, rugged design of Bristol's Instruments assures you of trouble-free operation for years, with a minimum of care and adjustment.

The Bristol Company *Waterbury, Connecticut*

FOR 38 YEARS — MAKERS OF — BRISTOL'S — RECORDING INSTRUMENTS

BRANCH OFFICES

BOSTON, MASS. — DETROIT, MICH.
NEW YORK, N. Y. — CHICAGO, ILL.
PHILADELPHIA, PA. — ST. LOUIS, MO.
PITTSBURGH, PA. — DENVER, COLO.
BIRMINGHAM, ALA. — SAN FRANCISCO, CAL.

BOONVILLE'S
RED LETTER DAY

TUESDAY, JULY 28

Will be a big day in Boonville!
On that day the people will celebrate

Turning on of Water
From Lake Drain

The time for the celebration has been set at 4 to 6 p. m. Tuesday. The turning on of the water will be an elaborate affair. No loyal Boonville citizen should miss this. Everybody invited. OLD MAN WATER SHORTAGE will be buried deep for evermore.

Everybody on the public square at 3:45 o'clock. Bring your car out. Invite your friends. We need extra cars and trucks to carry the people who do not have cars. Get in the parade to be formed on the public square and drive to the scene of action. THE BOONVILLE BAND will be on hand to add to the gayety of the day. The stores will be closed from 4 to 6 o'clock.

The big valve will be opened in the presence of the crowd. The speeches will be short. A surprise stunt is being arranged for you.

Doc. Traylor has been designated as Grand Marshal and he will be assisted by Chief Finch and other aides in forming the parade.

Be on the Public Square at 3.45 Prepared to Go with the Crowd!

L. L. ROTH, K. H. WEYERBACHER, F. W. TRAYLOR, Committee

Just cause for any city to rejoice—an ADEQUATE WATER SUPPLY!

NO WONDER this live and growing Indiana city celebrated! When Boonville's present up-to-date water system was installed, just three years ago, the city was facing a serious water shortage. The water supply was almost gone!

Today, Boonville is served by an abundance of pure, clean water brought direct for seven miles through cast iron pipe. As a city official said, "We shall have a cleaner city. Boonville can build a great city in the future in an industrial way."

Cast Iron Pipe was used to provide an adequate water supply for the residents of Boonville. They will never be faced with the expense of replacing this line. For Cast Iron Pipe is permanent pipe. Once installed it can be forgotten. There is no case on record in which it has failed under usual service conditions! That's a fact of interest to any engineer, city official, or tax payer. For other important facts about Cast Iron Pipe, and valuable technical information in regard to water supply systems, address inquiries to Thomas F. Wolfe, Engineer, Cast Iron Pipe Research Association, Peoples Gas Building, Chicago.

CAST IRON PIPE

HYTEMPITE

(Reg. U. S. Pat. Off.)

PEER OF HIGH TEMPERATURE CEMENTS

A Product of the

Quigley Furnace Specialties Company

HYTEMPITE has been known for years as the

STANDARD FOR COMPARISON

So why GAMBLE when purchasing your High Temperature Cement.

HYTEMPITE is not made to sell for a price to get your order, BUT is a quality product manufactured under expert supervision from carefully selected materials and is made for the sole purpose of giving you SERVICE and LONG LIFE when used for bonding fire brick or other refractory materials.

HYTEMPITE is universally used for the purpose of solving refractory maintenance problems.

QUIGLEY FURNACE SPECIALTIES CO.
INCORPORATED

26 Cortlandt Street - - - New York

There are Quigley Distributors in over 100 important industrial centers in the United States and Canada and elsewhere throughout the world.

BAROMETERS

PHILADELPHIA, THE WORKSHOP OF THE WORLD, has 14,000 Manufacturing Establishments of which many have World-Wide Reputations.

"PRINCO" STANDARD FORTIN MERCURIAL BAROMETERS

are in World-Wide use because they, too, have a "World-Wide Reputation"

THEY ARE GOOD BAROMETERS
THEY ARE REASONABLE IN PRICE!

For more than a decade they have been made in such manner that they can be shipped safely and successfully wherever there is a common carrier. This has been recognized as an achievement in Barometry.

PRECISION THERMOMETER & INSTRUMENT COMPANY
1439 BRANDYWINE STREET - - - - - PHILADELPHIA, PA.

AN IDEAL GAS BOILER *for* EVERY *heating need!*

For cottages or bungalows—with or without basements—an Ideal Arcola Gas Heater!

For small or medium-sized homes —Ideal 1G Gas Boiler!

For larger homes and buildings— Ideal 4G Gas Boiler!

For office buildings, big apartment houses, hotels — Ideal 4G Gas Boilers in multiple units!

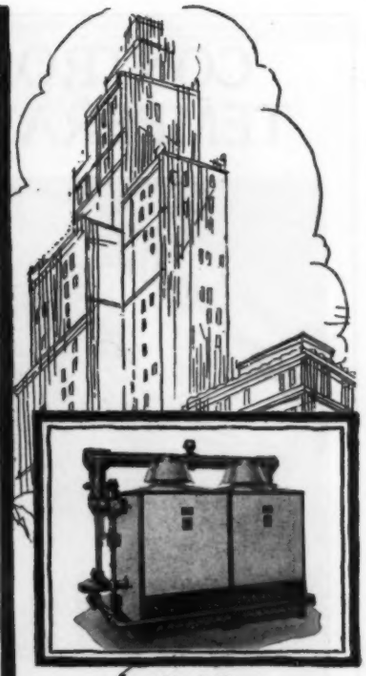
All these boilers are useful for large-volume hot-water supply and industrial applications.

THIS whole family of perfectly-designed gas boilers offers you *exactly* the right heating plant for *every* job on which you want to figure.

Designed and manufactured by the American Radiator Company, it is the latest triumph of their boiler engineers.

Ideal Gas Boilers are made available to you without delay by strategically-located distribution centers.

We have prepared for you a plan book covering every detail of selling plans that actually *work*. Won't you send for this complete and practical information?



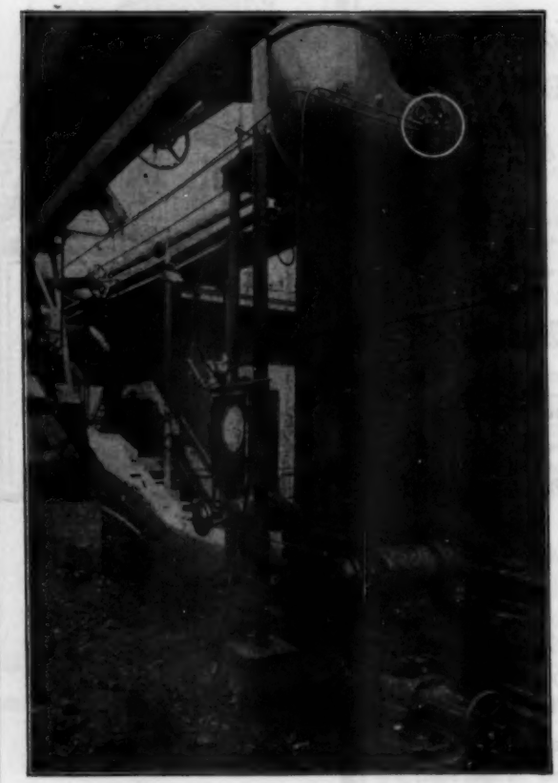
IDEAL GAS BOILERS

Product of AMERICAN RADIATOR COMPANY *Gas Utilization Dept.*

Write to AMERICAN GAS PRODUCTS CORPORATION, *Distributors*

376 Lafayette Street, New York City

CONTROL OF TEMPERATURES



In the Efficient Gas Plant, the controlling and recording of critical temperatures has proved an economy. Records of temperatures and pressures are records of plant operation. And such records of operation are guides to efficiency.

The gas from the condenser should be at the correct temperature entering the scrubbers. At this large New York Gas Plant the proper temperature is maintained automatically by an American Temperature Controller, which regulates the amount of water fed to the condenser. American Recording Thermometer produces a written record of the temperature, thus serving as a check on the controller.

Write for the following Catalogs:

Gas Maker's Gauge Catalog P-7
Recording Gauge Catalog E-7
Thermometer Catalog F-7
Recording Thermometer Catalog H-7
Tachometer Catalog J-7
Temperature Controller Catalog R-7

AMERICAN INSTRUMENTS

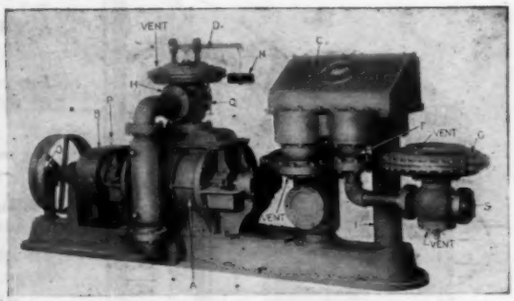
AMERICAN SCHAEFFER & BUDENBERG CORP.

338 BERRY ST. BROOKLYN, N. Y.

Branches in Principal Cities

Makers of American Industrial Instruments Since 1851

The Improved Kemp System



THERE is but one KEMP SYSTEM. There is nothing just as good —no other way to get the results which are had from the KEMP SYSTEM.

The big improvement in conditions and maximum benefits which you desire cannot be had by changing to high pressure, some other type of inspirator or a mixing fitting. It costs but little more to utilize with your operations some of the special applications which are common to the KEMP SYSTEM and are productive of the greatest benefits. The KEMP SYSTEM is the best investment.

Write, phone or telegraph today for a representative

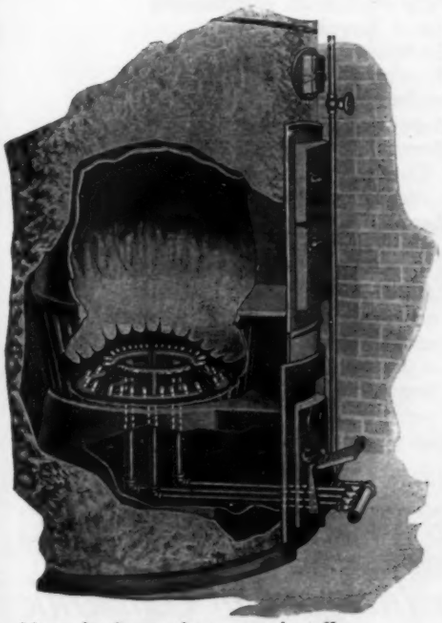
THE C. M. KEMP MFG. CO.

Baltimore, Md.

BARBER Patented JET GAS BURNERS

The hot water or steam sectional boiler illustrated above is equipped with a Barber Jet Gas Burner made up of six No. "U-25" Units.

It's Easy to Sell Gas for House Heating —with Barber Conversion Burners



Above is shown the proper installation of the No. "3-R-17" Barber Burner through the ash pit opening of a warm air furnace. The same idea is carried out in a round boiler; that is, by placing the burner low in the fire-box, the longest possible heat travel is obtained.

No new furnace or boiler is required, and the correct Barber Burner assembly properly installed will make any good coal-burning furnace or boiler a highly efficient gas heater—that should develop an efficiency of better than 80%.

Acquaint yourself with the REAL FACTS about conversion work—when properly done with Barber CONVERSION Burners. These burners are designed on a unique and scientifically correct principle that develops the highest efficiency of any gas burner operating on atmospheric pressure. They work equally well on artificial, natural or mixed gas. They will not back-fire, have no adjustable parts and are absolutely free from service troubles.

Thousands of installations are rendering users the utmost satisfactory service.

—BARBER—
No. 3-R-17.

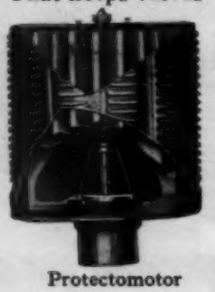
Now is the time to start your campaign on Conversion Work. Let us co-operate with you in building the much desired house-heating load with the utmost satisfaction to yourself and your customers. Write us today.

The CLEVELAND GAS BURNER & APPLIANCE CO.
Burner Specialists
3702-04 Superior Avenue, Cleveland, Ohio

Catches All the DUST
SAND AND GRIT IN DIRTY AIR

Triples Life of Compressors, etc.

The Protectomotor Air Filter removes 99 9/10 % of the dust, grit, sand and other foreign matter from the air before it enters Diesel engines, compressors, blowers, compressed-air tools, etc. That keeps valves free from carbon—reduces carbon deposits 60 to 70%.



Protectomotor

As a result 75 to 85% of the wear on moving parts is eliminated. Machines are kept new and more efficient, so they will do more work and can be operated from three to five times longer than unprotected machines before overhauling is necessary.

The Protectomotor occupies small space. Costs but little to install and nothing to operate. Has no moving parts to wear or get out of order.

Easily cleaned in ten minutes while in operation. Cleaning is necessary only twice a year under ordinary conditions.

Protectomotor Pipe Line Filter

Pipe lines equipped with the model CP Protectomotor Filter will deliver clean, dry air for paint spraying, compressed-air tools, hoists, cleaning operations, agitating liquids, ice-making, chemical processes, etc.

Sectional View Model CP Pipe Line Filter

It removes all water, oil, rust, scale and other foreign matter from air passing through pipes and prevents wear and damage caused thereby to tools and other compressed-air equipment.

Made in sizes to meet every requirement. Over 250,000 Protectomotor Air Filters in use.

FREE TRIAL OFFER

Let us send you a Protectomotor on 30 days' free trial. If it does not do all we claim, return it and the trial won't cost you a cent.

Write for booklet.

Staynew Filter Corporation

115 North Water Street, Rochester, New York

PROTECTOMOTOR
REG. U.S. PAT. OFF.
99 9/10 Per Cent EFFICIENT
AIR FILTERS

Tycos Temperature Instruments
INDICATING - RECORDING - CONTROLLING

FOR YOUR GAS PLANT

Ammonia Still Thermometers
Engraved Stem Thermometers
Flue-Gas Thermometers
Gas Ranges
Gas-Main Thermometers, Straight and Angle Stem
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Meter-Prover Thermometers
Precision, Engraved Thermometers
Pyrometers
Recording Thermometers
Still-Thermometers
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Temperature and Pressure Regulators
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Anemometers
Aneroid Barometers
Base Metal, Rare Metal and Radiation Pyrometers
Electric Contact Thermometers
Fery Radiation Pyrometers
Hand Levels
Hydrometers
Hygrometers
Inclinometers
Mercurial Barometers
Mercurial, Recording and Index Thermometers for all Industrial and Laboratory Applications
Mercury Column Vacuum Pressure and Gauges
Mineral Oil Testing Instruments
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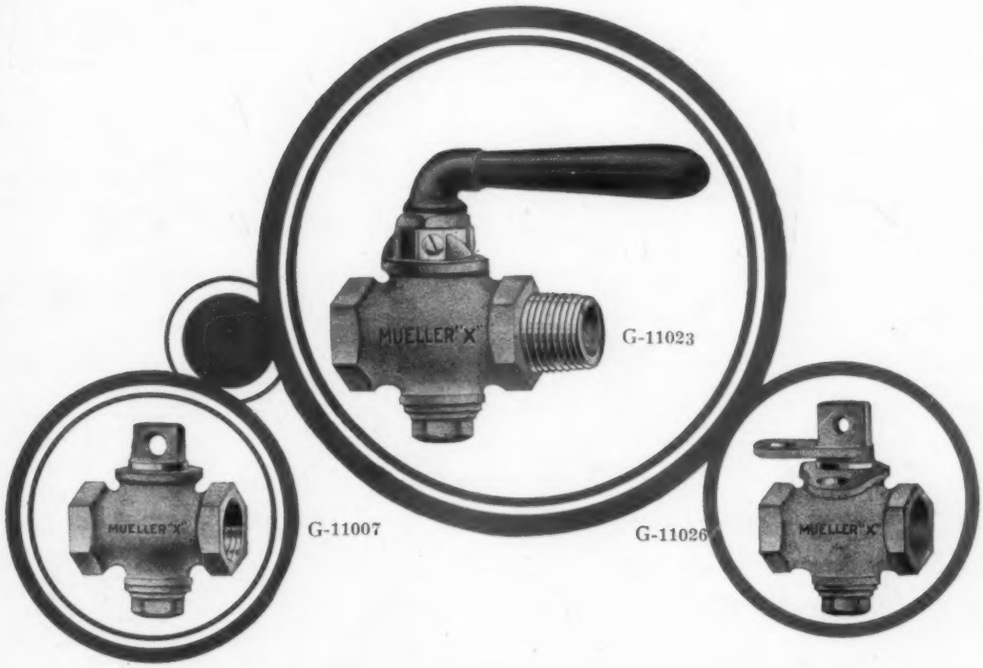
Canadian Plant
Tycos Building
Toronto

Manufacturing Distributors
in Great Britain
Short & Mason, Ltd., London

There's a Tycos or a Taylor Temperature Instrument for Every Purpose



You purchase *security* with these stops

Mueller quality is uniform throughout a complete line of gas stops for both high and low pressure. You are assured of good construction and long service when you standardize on Mueller Brass Gas Stops because all Mueller products are manufactured under strict laboratory control.

The workmanship and material in these stops are backed by seventy-one years of progressive manufacturing experience. Workmen like to use Mueller stops because of the accurate and clean-cut threads which make them easy to install.

The Mueller line of gas stops includes flat, tee square and socket head, with or without checks, as well as with Minneapolis top and with lock wings. They are made in straight and round way patterns for all standard pipe connections. Ask for prices and descriptions.

MUELLER CO. (*Established* 1857) **Decatur, Ill.**

Branches: New York, Dallas, San Francisco, Los Angeles

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MUELLER

"Without Consistency There Is No Moral Strength"—OWEN

For more than nine years American Stove Company has been a consistent advertiser in America's greatest national magazines. The combined circulation of a single issue of the publications* used is

16,187,475**

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****This figure does not include circulation of a strong list of class publications used in the field of food, cookery, architecture and building.**

AMERICAN STOVE COMPANY
801 Chouteau Avenue St. Louis, Mo.
LARGEST MAKERS OF GAS RANGES IN THE WORLD

These are the Six Famous Brands of Red Wheel Gas Ranges:
DANGLER • CLARK JEWEL • QUICK MEAL • DIRECT ACTION • NEW PROCESS • RELIABLE

LORAIN
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THE KOMPAK CO.

Automatic Thermostatic Gas Water Heaters

NEW BRUNSWICK
NEW JERSEY

The Kompak Automatic Heating System

In announcing this new and revolutionary gas heating system, we realize the tremendous importance which it is bound to have on the future of Gas House Heating.

A burner, designed by one of the most eminent gas engineers in the United States, applied to coal burning heaters, complete with automatic controls, guaranteed to give results equal to the best gas designed heaters and installed for about one-half the cost.

Every gas man will want to know about this wonderful opportunity for increased gas sales.

Yours very truly,

THE KOMPAK COMPANY.

COX'S COMPUTER

For High-Pressure Fluid Discharge

Will save hours of tedious, brain-tiring computation and get results instantly when seeking to find the discharge from a pipe. Also to find suitable initial and Terminal Pressures.

Based on a well-known and reliable formula, which is applicable to Gas, Air and other elastic fluids, flowing through pipes with high initial pressures.

Price $5.00 *each, net, in cloth case* 6½ *x* 8 *inches*

COX'S GAS-FLOW COMPUTER

For Low Pressures

This computer solves Prof. Pole's formula for the flow of gas in pipes. All the work is done for the Engineer in making computations relative to the subject covered by the title.

Price $5.00 *each, net, in cloth case* 6½ *x* 8 *inches*

For Sale by

AMERICAN GAS JOURNAL

53 Park Place - - - - New York City

REASONS *for* RECORD SALES VOLUMES

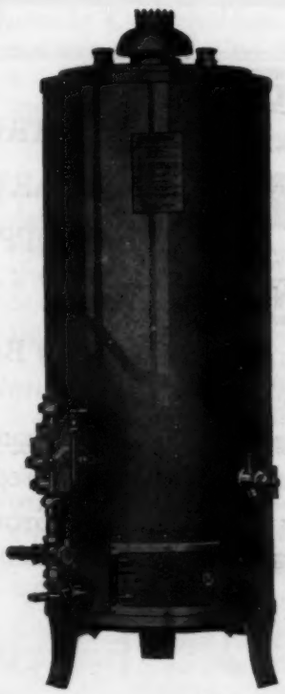
Are not in price alone or in any one thing.

Quality in every sense of value is important to both "after effects" and to actual selling.

Price is of nominal importance if value exists.

Plans and policies are of large importance.

It is in a happy combination of the foregoing and other points, too, that you find the answer to the wide volume selling of the splendid



HUMPHREY

Kalamazoo Automatic Storage Heater

which excels in

SERVICE
EFFICIENCY
DURABILITY
SAFETY
APPEARANCE

Prices are low for the high values contained. Policies behind the goods are known for goodness.

July and August plans promise unusual sales volume. Quick shipments protect it.

HUMPHREY COMPANY

KALAMAZOO (DIV. OF RUUD MFG. CO.) MICHIGAN

A FORMIDABLE-LOOKING COKE PILE SEEMS SMALL TO A HAISS LOADER!

--- even on a screening job.

Coke loading and direct-loader-screening are no longer bug-a-bears to the coke plant that's on its toes. Such plants find the big Haiss Loader, equipped with its powerful self-feeding propellers, the ideal in equipment to tear into the most obstinate pile of coke.

And when you purchase a Haiss Loader you too will find that this is no ordinary machine! It can be fitted with a *Vibrating Screen* which will clean coke as fast as it is loaded into a truck—even at 80 five-ton truck loadings per day.

Ask for Catalog 527 and mention your interest in SCREENING.

The George Haiss Manufacturing Co., Inc.
Park Ave. & 141st St., New York.

HAISS

SELF HEALING
CEMENT OR LEAD
SELF HEALING RINGS
JUTE
SOUTHWESTERN
PIPE JOINT RINGS

Make Your Gas Joints Self-Healing

Sample Ring for Test
Furnished on Request.
--No Charge--

Southwestern Pipe Joint and Engineering Company
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Used since 1897
Improved Locking Sleeve
GAS MAIN STOPPER

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DEPENDABLE GAS MAIN BAGS
Type A—Seamless
Type B—Reinforced Seams
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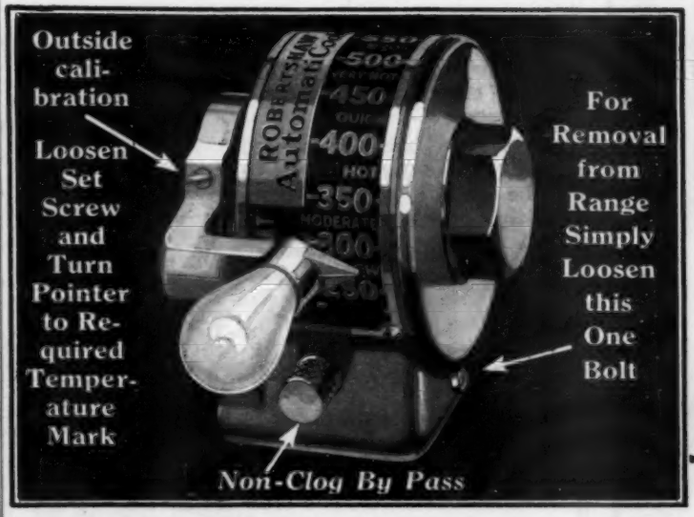
GOODMAN CYLINDRICAL STOPPER
Inflatable for higher pressures

SOAP TAPE
BRUSHES
PLUGS
JOINT RUNNERS
AIRLINE MASKS

Safety Gas Main Stopper Co.
523 Atlantic Ave., Brooklyn, N. Y.

GAS COMPANIES and STOVE DEALERS



Appreciate the Exclusive Advantages of the "B" Type

ROBERTSHAW AutomatiCook

Outside Calibration. Takes just a few seconds to change the temperature setting if required, by means of a convenient set-screw on the temperature pointer. Merely loosen the set-screw, move the pointer to the proper temperature mark on the dial, and then tighten the set-screw.

Quick Removal. Should the "B" Type AutomatiCook become damaged for any reason, necessitating replacement, it can be removed without disconnecting the range or disturbing the linings or the piping. Requires no mechanical servicing or repairs on the job. Simply loosen one bolt, replace the Thermostat with a spare and tighten the bolt. The job can be done in less than a minute's time.

Non Clog By-Pass Pilot. Will not clog nor bind. Always moves freely and maintains its adjustment. Eliminates servicing, adjusted by turning either to the right or left.

Non-Corrosive Valve Seat. The AutomatiCook is now being equipped with a Raised Non-Corrosive Valve Seat which will resist the corrosive action of gas, eliminating any possible trouble from this source.

Write for 8-Page Folder, illustrating and describing the above advantageous features.

ROBERTSHAW THERMOSTAT CO.

Youngwood, Penna.

The Robertshaw AutomatiCook is now used on more than 80 leading makes of Gas Ranges

DEHYDRATING EQUIPMENT FOR GAS PLANTS

COMPANY MEMBER

AMERICAN GAS ASSOCIATION

ANDALE

Sixteenth and Arch Streets
PHILADELPHIA

AKME CONSUMING FLUE

Highly recommended by Gas—Chemical—and Combustion Engineers for Gas Ranges, because it is the only safe and efficient flue to use.

Keeps the Kitchen free of grease and the dirt it collects.

Range Experts consider it a necessity for the more economical and better operation of gas ranges, on account of its scientific construction, and because it consumes grease by combustion.

Prevents hazards caused by connecting Ranges to the outside, or oven vents being open.

PATENTED

Silvergray Finish—Aluminum White Porcelain—Black Japan
(Also Colored Enamel in the No. 3 Size, to match ranges)

WORTH MANY TIMES THEIR COST

Write for particulars

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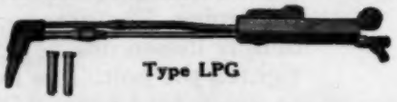
Byllesby Engineering and Management Corporation

BYLLESBY
PIONEERS IN PUBLIC SERVICE
ENGINEERING FINANCE MANAGEMENT

CHICAGO NEW YORK

Pittsburgh San Francisco

Lower Cutting Costs
With this Torch



Type LPG

Uses City Gas, Natural Gas or By-Product Gas

A torch especially developed for use with City Gas, Natural Gas or By-Product Gas. Employs famous Milburn principle of supermixing which results in greater efficiency and economy. Get full details of this LPG Cutting Torch and complete Milburn line of cutting and welding apparatus.

Ask for Booklet 3717 on Welding and Cutting Apparatus. Advise also if interested in Oil Pre-heaters, Paint Spray Equipment, Carbide Lights, etc.

THE ALEXANDER MILBURN COMPANY
1416-1428 W. Baltimore St. Baltimore, Md.

400 CR Series—4 section
500 CR Series—5 section
Finished in Mahogany, Crystal Enamel.

Get these *"Profits that never end!"*

Here's the way to make two profits grow where none grew before. Sell your unprofitable customer a Roper Sheetflame Radiant Heater.

You profit once on the sale itself. You profit again on the increased use of gas per meter. And that second profit never ends—it repeats itself every month the Roper Sheetflame is used.

This modern heating unit employs the correct principle of heat radiation. It is the only heater which operates with a solid sheet of flame extending across the entire heating surface.

A full variety of designs and sizes meets every preference as to price and appearance. You may offer your customer his color choice of Mahogany Crystal Enamel, Red Brown or Green Crystal Enamel and Black Enamel Finish. Antique Brass, Oxidized Brass and French Gray, also available.

Learn how the Roper Sheetflame Radiant Heater line can add to your profit from sales of both appliances and gas. Write for complete information.

GEO. D. ROPER CORPORATION
ROCKFORD, ILLINOIS

ROPER

Sheetflame
RADIANT HEATERS

No. 401—4 section
No. 501—5 section
Finished in Antique Brass or French Gray.

No. 541—5 section
No. 641—6 section
Finished in Antique Brass or French Gray.

All Roper Sheetflame Radiant Heaters carry the Blue Star Seal of Approval of The American Gas Association Testing Laboratory.

THE SOLID SHEET THROWS OUT MORE HEAT

RITER-CONLEY CO.
STEEL CONSTRUCTION
PITTSBURGH

STEEL PLATEWORK
FOR
THE GAS INDUSTRY

Gas Holders
Pressure Tanks
Steel Pipe
Steel Barges
Oil Tanks
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We can furnish Valves for working pressures up to 1200 lbs. per sq. in.
Send for Circular 5

The LUDLOW
VALVE MANUFACTURING COMPANY
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Don't Guess!

The only criterion of Oxide quality is what it will do in the purifying boxes.

Test Our
IRON BORING OXIDE
for Endurance, Activity and Revivability in your own boxes and be convinced of its superiority.

Let Us Help Solve Your Purifying Problems

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IRON BORING OXIDE
FOOT OF HALSEY STREET LONG ISLAND CITY NEW YORK
BRANCH YARD PROVIDENCE R.I.

LEADING GAS COMPANIES USE LAMBERT METERS

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
Provers
Pumps
Calorimeters
Wet Meters
Gauges
Apparatus

LAMBERT METER CO.
BUSH TERM. BLDG. 4, BROOKLYN, N. Y.

Save the Housewives——

From Burned Fingers, Scarred Wrists, Blistered Arms;--Prevent Soiled Dresses, Spilled Food, Greasy Stoves and Floors, by Specifying

PARKE

SAFETY OVEN SHELVES

Every gas company will make a host of feminine boosters with this device, that enables the housewife to prepare her oven roasts and baking with safety and dispatch, with no fear of the hazards that are ever present in gas range oven cooking.

Womenfolk are quick to appreciate any device designed for their safety, convenience and comfort in preparing the family meals; and when once convinced that this device meets these requirements will gladly spread the news to their sisters. There is no better advertising than comes from the lips of a pleased woman.

Furthermore, the Parke Safety Oven Shelves have been tested and approved by the Good Housekeeping Institute and the Herald-Tribune Institute, besides some of the largest Gas Companies in the East.

There is nothing complex in the Parke Safety Oven Shelves. They are the acme of Simplicity.

Made of heavy gauge steel wire with enamel baked on, they can be quickly cleaned. Hot shelves cannot be pulled out completely because of safety stops. Patented adjustable handle obviates use of towels or cloths. Can be installed in a few minutes.

A Big Opportunity exists for the gas company to build up an increased cooking load as well as profit from the sale of the appliance, and foster the good will of your customers.

It is Worth Looking Into

Write *At Once* for Fuller Information

WILLIAM PARKE, Inc.

537-549 So. Second St., Camden, N. J. --- New York Office, 29 Perry St.

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Silica
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Semet-Solvay Engineering Corp.
Western Gas Construction Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
Geo. Haiss Mfg. Co.
C. W. Hunt Co., Inc.
Dry Quenching Equipment Corp.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
United Engineers & Constructors
Western Gas Construction Co.

COAL TAR PRODUCTS
Western Gas Construction Co.

COAL TUBS
C. W. Hunt Co., Inc.

COCKS
Angle Stove
Mueller Co.
Boiler Drain
Mueller Co.
Hose
Mueller Co.
Meter
Kitson Company
Mueller Co.
Service
Kitson Co.
Mueller Co.

COKE CRUSHERS
Semet Solvay Engineering Corp.

COKE QUENCHING
Dry Quenching Equipment Corpn.

COMPUTERS
Heating Value
United Engineers & Constructors

CONDENSERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
Western Gas Construction Co.
High Duty
United Engineers & Constructors

CONTRACTORS' TUBS
C. W. Hunt Co., Inc.

CONTROLS
Am. Schaeffer & Budenberg Corp.
Bartlett-Hayward Co.
The Gas Machinery Co.
Robertshaw Thermostat Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
United Engineers & Constructors
Taylor Instrument Cos.
Western Gas Construction Co.
Hot Water Heat System
Mueller Co.

CONVEYORS
Geo. Haiss Mfg. Co.
C. W. Hunt Co., Inc.
Isbell-Porter Co.
The Koppers Construction Co.
Semet Solvay Engineering Corp.

CONCENTRATORS AMMONIA
Bartlett-Hayward Co.
The Gas Machinery Co.
Isbell-Porter Co.
Semet Solvay Engineering Corp.

COOLERS
Andale Co.
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

COOLING COILS
Semet-Solvay Engineering Corpn.

COUPLINGS
Bartlett-Hayward Co.
S. R. Dresser Manufacturing Co.
National Tube Co.
P. H. & F. M. Roots Co.

CRUSHERS
C. W. Hunt Co., Inc.

DE-EMULSIFIERS
Semet-Solvay Engineering Corpn.

DEHYDRATORS, GAS
Andale Co.

DERRICK—PIPE
Safety Gas Main Stopper Co.

DISCHARGING MACHINERY
Bartlett-Hayward Co.
Russell Engineering Co.

DOMESTIC INCINERATORS
Kernit Incinerator Co.

DRAFT GAUGES
Am. Schaeffer & Budenberg Corp.
Bristol Co., The
Precision Ther. & Inst. Co.

DRILLING MACHINES
Mueller Co.

ELECTRIC LOCOMOTIVES
C. W. Hunt Co., Inc.

ELEVATORS
Craig Ridgway & Son Co.

ENGINE INDICATORS
Am. Schaeffer & Budenberg Corp.

ENGINEERS
Combustion
Bartlett-Hayward Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Smoot Engineering Corp.
Consulting
Bartlett-Hayward Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
United Engineers & Constructors
George H. Waring
Contracting
Andale Co.
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
Isbell-Porter Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
United Engineers & Constructors
Western Gas Construction Co.

EXHAUSTERS
The Connersville Blower Co.
The Gas Machinery Co.
Isbell-Porter Co.
P. H. & F. M. Roots Co.
The Stacey Mfg. Co.
United Engineers & Constructors

EXPANSION BENDS
Mueller Co.

FILES (Steel and Wood)
Remington Rand Business Service, Inc.

FIREBRICK—CHECKER BRICK
Botfield Refractories Co.
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Co.
United Engineers & Constructors
Western Gas Construction Co.

FIREBRICK, CEMENT
Botfield Refractories Co.
Quigley Furnace Spec. Co., Inc.

FITTINGS
Isbell-Porter Co.
The Gas Machinery Co.
Mueller Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
U. S. Cast Iron Pipe & Fdy. Co.
Western Gas Construction Co.

FITTINGS, FLANGED
U. S. Cast Iron Pipe & Fdy. Co.

FITTINGS
Pipe
American Cast Iron Pipe Co.
Semet-Solvay Engineering Corp.

FIXTURES
General Gas Light Co.
Welsbach Co.

FLOORS, IRON, BRICK AND STEEL
Western Gas Construction Co

FLUE PIPE (Cast Iron Oval)
James B. Clow & Sons

Wipe out *the spoilage bugaboo!*

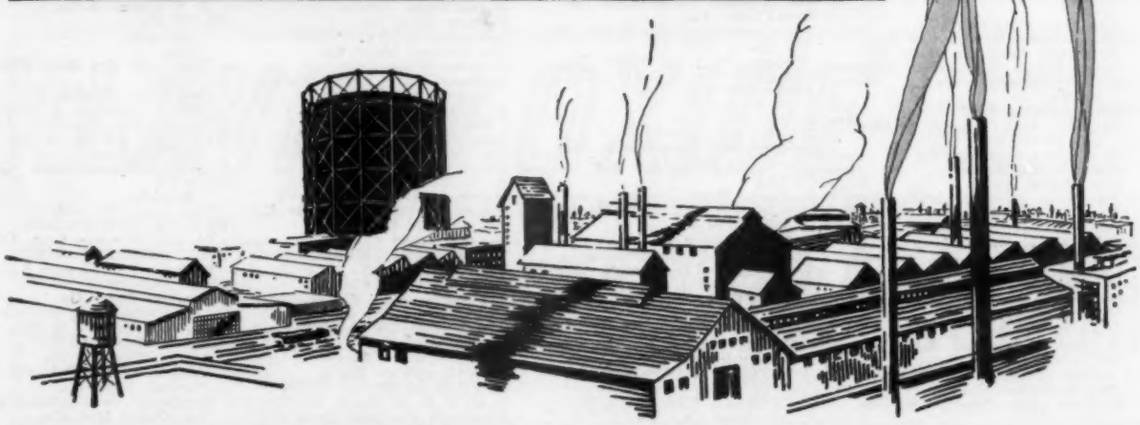
SPOILAGE costs mount rapidly with old-fashioned methods of heat-treating. Temperature control is difficult—fluctuations cannot be prevented. Your "reject" records tell the story.

Gas, on the other hand, insures *perfect* control. Its regulation requires no more than the turning of a valve or the automatic operation of a thermostat. Gas responds *instantly*, maintains a constant temperature. Uniformity of product is assured. Spoilage is minimized.

Your local gas company will tell you why industry has found over 21,000 profitable uses for gas; or write to

American Gas Association
420 Lexington Avenue, New York City

YOU CAN DO IT BETTER WITH GAS



The Industrial Section of the A. G. A. is broadcasting the above advertisement in a number of engineering and industrial papers for the benefit of the gas industry at large

Buyers' Reference Index

See page 115 for advertisements of these products

FLUES (Consuming) for Gas Range
Akme Flue, Inc.
FURNACES
Gas Fired
Warm Air
Geo. D. Roper Co.
GAS ANALYSIS APPARATUS
American Meter Co.
S. R. Dresser Manufacturing Co.
Metric Metal Works
Precision Ther. & Inst. Co.
United Engineers & Constructors
GASKETS
Southwestern Pipe Joint & Engineering Co.
Safety Gas Main Stopper Co.
GAS MASKS
Safety Gas Main Stopper Co.
GAS PLANTS, COMPLETE
Bartlett-Hayward Co.
Carl Still, Incorporated.
The Gas Machinery Co.
Gas Engineering Co.
The Improved Equipment Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors
Western Gas Construction Co.
West Gas Improvement Co.
GAS TESTING APPARATUS
Alpha-Lux Company, Inc.
Lambert Meter Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
Precision Ther. & Inst. Co.
Superior Meter Co.
United Engineers & Constructors
GAUGE BOARDS
Am. Schaeffer & Budenberg Corp.
Western Gas Construction Co.
GAUGES
Am. Schaeffer & Budenberg Corp.
American Meter Co.
The Bristol Co.
Connelly Iron Sponge & Gov. Co
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
Metric Metal Works
Safety Gas Main Stopper Co.
Taylor Instrument Companies
Pressure-Recording
American Schaeffer & Budenberg Co
D. McDonald & Co.
Superior Meter Co.
GLOVES
Rubber
Leather
Safety Gas Main Stopper Co.
GOVERNORS
The Stacey Mfg. Co.
Automatic
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Coke Oven
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
The Gas Machinery Co.
The Koppers Construction Co.
Pittsburgh Equitable Meter Co.
Semet Solvay Engineering Corp
Smoot Engineering Corp.
District
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov Co.
Groble Gas Regulator Co.
Helme & McIlhenny
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
Exhauster
Chaplin-Fulton Mfg Co.
Connelly Iron Sponge & Gov. Co.
The Connersville Blower Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co
Smoot Engineering Corp.
High Pressure
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
P. H. & F. M. Roots Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Laboratory
D. McDonald & Co.
Low Pressure
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The Sprague Meter Co.
Retort House
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
The Gas Machinery Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
Service
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Mueller Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Station
The Sprague Meter Co.
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Helme & McIlhenny
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Semet Solvay Engineering Corp.
Station Automatic
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov Co.
Pittsburgh Equitable Meter Co.
GRAVITOMETERS
Precision Thermometer & Instrument. Co.
Taylor Instrument Cos.
HEATERS
Room
James B. Clow & Sons
General Gas Light Co.
Homestead Heater.
Welsbach Company
HEATERS (WATER)
Hot Water
Electric Porcelain & Mfg. Co.
Humphrey Co.
Kompak Company
Welsbach Co.
House
American Gas Products Corp.
HOISTS
C. W. Hunt Co., Inc.
Geo. Haiss Mfg. Co., Inc.
HOLDERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Koppers Construction Co.
Riter-Conley Co.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
Western Gas Construction Co.
HOPPERS—COAL AND COKE
Bartlett-Hayward Co.
Cruse-Kemper Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
HOTELS
Shelburne Hotel.
HYDROGEN GAS APPARATUS
Bartlett-Hayward Co.
Gas Engineering Co.
The Improved Equipment Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
HYDROMETERS
Precision Ther. & Inst. Co.
Taylor Instrument Companies
INCINERATORS—GAS FIRED
Kernit Incinerator Co.
INDUSTRIAL GAS MIXERS
Geo. D. Roper Corp.
INDUSTRIAL TRACK
C. W. Hunt Co., Inc.
INSTRUMENTS
Am. Schaeffer & Budenberg Corp.
The Bristol Co.
Metric Metal Works
Precision Ther. & Inst. Co.
P. H. & F. M. Roots Co.
Taylor Instrument Cos.
United Engineers & Constructors
Recording
Am. Schaeffer & Budenberg Corp.
Alpha-Lux Company, Inc.
Superior Meter Co.
JOINTS (Pipe)
Southwest Pipe Joint & Eng. Co.
Semet-Solvay Engineering Corp.
U. S. Cast Iron Pipe & Foundry Co.
Insulating
Semet-Solvay Engineering Corp.
United Engineers & Constructors
JOINT RUNNERS
Safety Gas Main Stopper Co.
LAMPS
General Gas Light Co.
Kitson Co.
Welsbach Co.
LAMP POSTS
General Gas Light Co.
Kitson Co.
Welsbach Street Lighting Co. of America
LOADERS—BUCKET, PORTABLE
Geo. Haiss Mfg. Co.
LOOSE LEAF EQUIPMENT
Remington Rand Business Service, Inc.
MANILA & WIRE ROPE
C. W. Hunt Co., Inc.
MANTLES
General Gas Light Co.
Welsbach Co.
MASKS—GAS
Melters
Connelly Iron Sponge & Gov. Co
The Safety Gas Main Stopper Co
MAST & GAFF OUTFITS
Geo. Haiss Mfg. Co.
C. W. Hunt Co., Inc.
MEASURING CHUTES
C. W. Hunt Co., Inc.
METERS
Air
American Meter Co.
The Connersville Blower Co.
John J. Griffin & Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works
Neptune Meter Co.
Pittsburgh Equitable Meter Co.
P. H. & F. M. Roots Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
United Engineers & Constructors
Artificial
American Meter Co.
John J. Griffin & Co.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Neptune Meter Co.
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Demand
D. McDonald & Co.
Dry
American Meter Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Natural Gas
American Meter Co.
The Connersville Blower Co.
John J. Griffin & Co.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
P. H. & F. M. Roots Co.
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Oil
Western Gas Construction Co.
Prepayment
American Meter Co.
John J. Griffin & Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Station
American Meter Co.
The Connersville Blower Co.
The Gas Machinery Co.
John J. Griffin & Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
P. H. & F. M. Roots Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Steam
United Engineers & Constructors
Test
American Meter Co.
John J. Griffin & Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
METER CONNECTIONS
American Meter Co.
Bartlett-Hayward Co.
S. R. Dresser Manufacturing Co.
D. McDonald & Co.
Maryland Meter Works
Mueller Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
MIXERS, GAS
The C. M. Kemp Mfg. Co.
Geo. D. Roper Corp.
Smoot Engineering Corp.
MOTOR CARS
C. W. Hunt Co., Inc.
NAPHTHALENE EXTRACTORS
Semet-Solvay Engineering Corp.
Western Gas Consruction Co.
ORE, CHROME
Botfield Refractories Co.
Lavino, E. J. & Co.
OVENS COKE AND GAS
Carl Still, Incorporated.
The Gas Machinery Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
United Engineers & Constructors
OXIDE
Alpha-Lux Company, Inc.
Connelly Iron Sponge & Gov. Co
Gas Purifying Materials Co., Inc
E. J. Lavino & Co.
PACKING
Asbestos
Jute
The Safety Gas Main Stopper Co.
PAINTS
Jos. Dixon Crucible Co.
United Engineers & Constructors
Wailes Dove-Hermiston Corp.
PAINTS, ANTI ACID AND ALKALI
Quigley Furnace Spec. Co., Inc.
PAINTS
Graphite
Jos. Dixon Crucible Co.
PAINTS, RUSTPROOF
Quigley Furnace Spec. Co., Inc.
PHOTOMETERS (JET)
Connelly Iron Sponge & Gov. Co.
PHOTOMETERS
Lambert Meter Co.
United Engineers & Constructors
Warren Foundry & Pipe Co.
PIPE
Bartlett-Hayward Co.
Cast Iron Pipe Publicity Bureau
National Tube Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.

WESTMORELAND "CRITERION" GAS COAL

The Standard for Gas Making Since 1854

Since this Company commenced operations, its well-known Westmoreland "Criterion" Gas Coal has been largely used by the Gas Companies of Northeastern United States and Canada, and its character is established as having no superior in gas giving qualities and freedom from sulphur and other impurities.

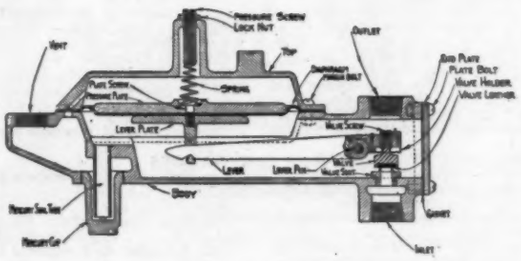
Mines situated on the Pennsylvania Railroad,
in Westmoreland County, Pa.

THE WESTMORELAND COAL COMPANY

Principal Office, Lewis Building, 15th and Locust Sts., Philadelphia, Pa.

Shipping Ports: Philadelphia, Baltimore, South Amboy, N. J., Lake Ports.

GROBLE REGULATORS & GOVERNORS



The removable orifice makes it possible to maintain maximum volumes with variable inlet pressure.

GROBLE GAS REGULATOR COMPANY
Anderson, Indiana

Representatives

Utilities Service Co., Peoples Gas Building, Chicago.
H. E. Broughton, 404 Donovan Building, Detroit.
L. E. Tremain, 302 Finance Building, Cleveland.
The Worrall Co., 427 Central Ave., East Orange, N. J

Gas Outlets

Lava, as a seat for gas consumption, is the material approved by manufacturers of gas appliances. Lava is an ideal, hard, non-corrosive substance, that preserves the uniformity of the gas flame.

American Lava Corporation
29-59 William St. Chattanooga, Tenn.
Manufacturers of Lava Tips & Heat Resistant Insulators

LAVINO OXIDE

Intensely Active. High Total Sulphur Absorption at Minimum Cost.

"THE EFFICIENT PURIFIER"

The Sponge with the large Tough Shavings Always Uniform

LAVINO SPONGE

E. J. LAVINO and COMPANY - BULLITT BLDG. - PHILADELPHIA, PA.
NEW YORK CHICAGO PITTSBURGH

Buyers' Reference Index

See page 115 for advertisements of these products

U. S. Cast Iron Pipe & Fdy. Co.
Western Gas Construction Co.
Bell
Donaldson Iron Co.
Cast Iron
James B. Clow & Sons
Donaldson Iron Co.
McWane Cast Iron Pipe Co.
Copper Service
Mueller Co.
Flange
Donaldson Iron Co.
U. S. Cast Iron Pipe & Fdy. Co.
Spigot
Donaldson Iron Co.
Steel
Smith Corpn., A. O.
Welded Steel
The Stacey Mfg. Co.
Semet-Solvay Engineering Corp.

PIPE COATINGS
Wailes Dove-Hermiston Corp.

PRESSURE HOLDERS
The Stacey Bros. Gas Const. Co.

PLATES
Floor
Cruse-Kemper Co.
Gas Engineering Co.
Riter-Conley Co.
Russell Engineering Co.
The Stacey Mfg. Co.

PLUGS SERVICE AND MAIN
Rubber
Soft Wood
The C. M. Kemp Mfg. Co.
Soft Wood
The Safety Gas Main Stopper Co.

PRODUCER GAS PLANT
Gas Engineering Co.
The Gas Machinery Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors
Western Gas Construction Co.

PROVERS—METER
American Meter Co.
Helme & McIlhenny
Lambert Meter Co.
D. McDonald & Co.
Pittsburgh Equitable Meter Co.
Superior Meter Co.

PUMPS
Lambert Meter Co.
P. H. & F. M. Roots Co.
Superior Meter Co.
Drip
The Connersville Blower Co.
D. McDonald & Co.
Mueller Co.
George D. Roper Corp.
Gas Bag
The Safety Gas Main Stopper Co.
Hand
George D. Roper Corp.
Oil
The Connersville Blower Co.
D. McDonald & Co.
George D. Roper Corp.
Semet Solvay Engineering Corp.
Power
George D. Roper Corp.
Pressure
D. McDonald & Co.
Service
The Safety Gas Main Stopper Co.
Service Cleaner
Mueller Co.
Tar
The Connersville Blower Co.
D. McDonald & Co.
George D. Roper Corp.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp
Vacuum
D. McDonald & Co.
P. H. & F. M. Roots Co.
Water
George D. Roper Corp.

PURIFIERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors
Western Gas Construction Co.

PURIFYING MATERIALS
Alpha-Lux Company, Inc.
Connelly Iron Sponge & Gov. Co.
Cruse-Kemper Co.
Gas Purifying Materials Co., Inc
Lavino, E. J., & Co.

PURIFIER TRAYS
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors

PYROMETERS
Indicating
Recording
The Bristol Co.
Taylor Instrument Companies
Optical
Radiation
Pyrometer Instrument Co.

RADIATORS
Gas Steam
Gas Water
James B. Clow & Sons

RANGES—GAS
American Stove Co.
Electric Porcelain & Mfg. Co.
Geo. D. Roper Corp.

REAMERS
Pipe End
Mueller Co.

REFRACTORY CEMENTS
Botfield Refractories Co.
Quigley Furnace Spec. Co., Inc.

REFRACTORY GUN
Botfield Refractories Co.
Quigley Furnace Spec. Co., Inc.

REFRACTORY LININGS
Alpha-Lux Company, Inc.
Botfield Refractories Co.
The Gas Machinery Co.
The Jersey City Refractories Co. Inc.
E. J. Lavino & Co.
Russell Engineering Co.
Quigley Furnace Spec. Co., Inc.
Semet Solvay Engineering Corp.
United Engineers & Constructors

REGULATORS
Am. Schaeffer & Budenberg Corp.
American Stove Co.
The Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Isbell-Porter Co.
Groble Gas Regulator Co.
Mueller Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Robertshaw Thermostat Co.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The Sprague Meter Co.
Taylor Instrument Companies

RETORT CEMENT
Alpha-Lux Company, Inc.
Botfield Refractories Co.
The Improved Equipment Co.
The Jersey City Refractories Co. Inc.
E. J. Lavino & Co.
Quigley Furnace Specialties Co., Inc.
Russell Engineering Co.

RETORTS
The Jersey City Refractories Co., Inc.
E. J. Lavino & Co.
Riter-Conley Co.
Horizontal and Inclined
Silica and Clay
The Gas Machinery Co.
The Improved Equipment Co.
Russell Engineering Co.
Silica and Clay
The Gas Machinery Co.
The Improved Equipment Co.
The Jersey City Refractories Co. Inc.
Russell Engineering Co.
Vertical
United Engineers & Constructors

RUBBER RINGS
Southwestern Pipe Joint & Engineering Co.

SAFES
Cabinet and File
Remington Rand Business Service, Inc.

SCALES
C. W. Hunt Co., Inc.

SCRUBBERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
United Engineers & Constructors
Western Gas Construction Co.

SERVICE BOXES
Mueller Co.

SERVICE PLUG—RUBBER
The Safety Gas Main Stopper Co.

SKIP HOISTS
C. W. Hunt Co., Inc.

SPONGE
Alpha-Lux Company, Inc.
Connelly Iron Sponge & Gov. Co.
Gas Purifying Materials Co., Inc.
Lavino, E. J., & Co.

SPRAYERS, PAINT
Milburn Co., The Alexander

STRAINERS—GAS, STEAM, WATER
Andale Co.

STATION METERS
American Meter Co.
The Connersville Blower Co.
The Gas Machinery Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
P. H. & F. M. Roots Co.

STATIONERY—LITHOGRAPH
Remington Rand Business Service, Inc.

STEAM ACCUMULATORS
The Gas Machinery Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
United Engineers & Constructors

STOPPERS
The Safety Gas Main Stopper Co.

STREET DEPT. EQUIPMENT
The Safety Gas Main Stopper Co.

STOVES—GAS
Electric Porcelain & Mfg. Co.
Geo. D. Roper Corp.

STREET LAMPS
General Gas Light Co.
Kitson Co.
Welsbach Street Lighting Co. of America

SYSTEMS
Combustion Control
The C. M. Kemp Mfg. Co.
Smoot Engineering Corp.
Hot Water Heat Control
Mueller Co.

TACHOMETERS
Bristol Co., The
Precision Ther. & Inst. Co.

TANKS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
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